GREEN RIVER WATERSHED, KENTUCKY AND TENNESSEE

HEARING

BEFORE A

SUBCOMMITTEE OF THE COMMITTEE ON PUBLIC WORKS UNITED STATES SENATE

EIGHTY-SECOND CONGRESS

SECOND SESSION

ON

S. 2616

A BILL AUTHORIZING A PROGRAM FOR RUNOFF AND WATER-FLOW RETARDATION AND SOIL-EROSION PREVENTION FOR THE GREEN RIVER WATERSHED IN KENTUCKY AND TENNESSEE

SEPTEMBER 20, 1952

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GREEN RIVER WATERSHED, KENTUCKY AND TENNESSEE

SATURDAY, SEPTEMBER 20, 1952

UNITED STATES SENATE,
SUBCOMMITTEE ON FLOOD CONTROL, RIVERS, AND
HARBORS OF THE COMMITTEE ON PUBLIC WORKS,
Washington, D. C.

The subcommittee met at 10 a. m. in the high-school auditorium at Central City, Ky., Senator Earle C. Clements presiding.

Present: Senator Clements; also present, Senator Thomas R. Underwood, Representative Garrett L. Withers, and Hon. Lawrence W. Wetherby, Governor of the Commonwealth of Kentucky.

Senator CLEMENTS. The hearing will come to order. I would like to ask the congregation to stand and sing the first verse of America, with accompaniment by the Central City High School band, after which Rev. Francis Tallent will deliver the invocation.

STATEMENT OF HON. A. P. HARDING, MAYOR OF THE CITY OF CENTRAL CITY, KY.

Mr. HARDING. As mayor of this little town of Central City, I want to take this opportunity to greet each and every one of you and to say just how happy we are to have all of you here to visit with us. It is a great privilege we have here in Central City today to welcome this fine group of citizens of the Green River watershed and representatives of government. We think this is one of the greatest days in the history of Central City and appreciate your presence and your coming here to be with us. If there is anything we can do to make your stay here any happier, we will be glad to do it if you will let us know. We will make every effort to make you comfortable and happy while you are here, and we are very glad to have you as our guests.

We have some telegrams from people who were invited and who expected to be here, saying for one reason or another that they could not be here. I would like to read those to you.

ALBERT P. HARDING,
Executive Vice President-Secretary,
Green River Valley Citizens League, Inc.,
Central City, Ky.:

Regret that illness prevents my attending public hearing in connection with Green River program. Have requested and authorized Senator Clements to hold hearing on behalf of House Public Works Committee at time he holds same for Senate Public Works Committee. I am deeply interested in Green River problems and have and will continue to fight for same.

JOHN C. WATTS, *Member of Congress.*

A. P. HARDING,
Green River Valley Citizens League, Inc., Central City, Ky.:

Approve your program. Will support in Congress. Previous speaking engagement in campaign prevents being present.

JAMES S. GOLDEN, *Member of Congress.*

A. P. HARDING,
Green River Valley Citizens League, Inc., Central City, Ky.:

Have just returned to Mayfield, have an accumulation of appointments for next week end, but am endeavoring to rearrange schedule to attend your meeting. If it is at all possible, will certainly be present.

NOBLE J. GREGORY, *Member of Congress.*

Mr. C. A. REIS,
Green River Valley Citizens League, Inc., Central City, Ky.:

We have been greatly interested in your Saturday meeting. However, due to inability to attend, Mr. Brown has prepared a statement of facts which should be helpful, particularly for the record. Mr. Pope and Mr. Whitmer will be there to represent us. I wish you an abundance of success with your efforts.

KENTUCKY UTILITIES CO.,
R. M. WATT, *President.*

A. P. HARDING,
Green River Valley Citizens League, Inc., Central City, Ky.:

Regret unable attend public hearing tomorrow; however, thank you for your kindness in inviting me to this hearing and luncheon.

T. H. HOFFMAN.

I am sure others would have liked to have been here but for reasons best known to them could not attend today; however, I think this is certainly a representative group; and I feel that we are well represented by every group interested in this Green River Valley watershed program. Senator Clements will be the chairman of this hearing. At this time I would like to introduce Hon. Earle C. Clements as chairman.

Senator Clements.

Senator CLEMENTS. In opening this meeting this morning—if I get it correct, Mr. Mayor, all witnesses are going to testify standing; is that correct?

Mr. HARDING. Yes.

Senator CLEMENTS. All right; that being the case, I do not want to be an exception to the rule. First I want to say to this fine representative group that if there is anyone from the Corps of Engineers or of the Department of Agriculture or any Members of Congress or prospective Members of Congress who has had any doubt in their mind that there was no great interest in the development of Green River area, all they need to know to remove that doubt is to ascertain the residences and the businesses of this fine representative group assembled in this room this morning. This is not a group that has been herded in from off the streets. This is a group of sincere people interested in bringing further development to this area and eliminating all appearance of blight from the valley. I am happy that the privilege is mine in being here with you, and I want to welcome you on behalf of the Senate Public Works Committee. This hearing has a multiple purpose; namely, (1) to hear new evidence pertinent to the development of the Green River Valley; (2) to answer and clarify any questions raised relevant to the several phases of the Green River Valley

development, (3) to coordinate facts and ideas bearing directly upon the component parts of the Green River Valley development.

If our common problems are to be solved, we must approach them from an over-all point of view and recognize that they are not the concern of any one agency of government but rather a joint undertaking of the several agencies of government as well as the responsibility of the people of this valley.

The agenda to be followed today in exploring the various aspects of the Green River Valley development will be considered in three parts, namely:

(*a*) The Green River watershed conservation program as covered by bills now pending in the Congress introduced by Congressman John C. Watts in the House of Representatives and Senator Thomas R. Underwood and me in the United States Senate.

(*b*) Flood control and water storage authorized in the Flood Control Act of 1938 and other legislation.

(*c*) Drainage and navigation improvements now under study by the Corps of Engineers under authority of the resolution adopted by the Senate Public Works Committee April 15, 1949.

At this time I should like to welcome and to recognize some of you who are agents of our Government. I would like to present to you the Members of Congress that are here and also those who would be willing to represent their areas in the Congress. First I would like to present my colleague in the Senate, Tom Underwood; my predecessor in the Senate, and present Congressman in your district, Garrett Withers. I understand John Cooper is in town, and when he appears on the scene I would appreciate the privilege of presenting him to this group. We have here one who would be willing to serve this district, Dave Brodie, of Owensboro. We have a number of representatives of the State government with us today. First I would like to present to you today one I have a very great affection for because I have had the opportunity to see him operate at close range, and I think I know somewhat what is in his heart, and it is a pure heart, Lawrence Wetherby, your Governor. We have here the commissioner of conservation in Kentucky. He resides to the west of you. If I said all the worth-while things that I know this fellow has done in government, some of you might accuse me of making a campaign speech, but that is not my purpose, Henry Ward.

If I were to present all the people here today from local communities here who hold positions of responsibility it would take too long, but I am sure some opportunity will be given to recognize some of you who are representing some groups.

We have here from the Corps of Engineers representatives who I know you will want to, and are going to hear from them later, but I would like to tell you who they are now: Col. Paschal N. Strong, division engineer, Ohio River division, representing the Chief of Engineers, Department of the Army; Col. Wright Hiatt, Deputy Chief of Civil Works for Flood Control, Corps of Engineers, Washington, D. C.; Col. Clarence Bidgood, district United States engineer, Louisville, Ky.; S. M. Bailey, chief engineer, Louisville district office; and Col. R. G. West. We have Representative Garrett Withers. We have Tom Wallace, editor emeritus, Louisville Times, long interested in conservation.

From the Department of Agriculture we have Assistant Secretary of Agriculture Hon. Knox T. Hutchinson. With Mr. Hutchinson, Richard A. Hertzler, from the land and water resources staff, Office of the Secretary of Agriculture; Carl B. Brown, Soil Conservation Service; and H. C. Wilm, Forest Service, all from the United States Department of Agriculture. From the Department of the Interior: Roy K. Wood, in charge of river basin studies, Fish and Wildlife Service, region 1, headquarters at Atlanta; A. P. Bursley, Chief of Land and Recreation Planning Division, National Park Service, region 1, headquarters, Richmond, Va.; and C. T. Reed, also with the Department of the Interior. During the hearing these gentlemen will give us the viewpoint of their respective agencies and will answer questions on the several phases of the Green River Valley development.

Prior to launching into the heart of today's hearing, it might be well to review briefly together the historical background of the water resources development in the Green River Basin.

Improvement of the water resources of the Green River Basin was begun over 100 years ago by the Commonwealth of Kentucky with the building of locks and dams to provide for slack-water navigation. In 1888 the Congress passed a law authorizing the Federal Government to purchase these original locks and dams from the Commonwealth and to maintain and operate them.

In the Flood Control Act of 1936 Congress adopted the policy of participating in the planning and construction of flood-control improvements in the interest of the general welfare, if the benefits are in excess of the estimated costs and if the lives and social security of people are otherwise adversely affected.

In this act Congress also recognized the fact that river basins include both the flowing streams and the watershed areas which drain into the streams. It provided that planning and construction of improvements of rivers and other waterways for flood control and allied purposes shall be under the jurisdiction of the Secretary of the Army and the Chief of Engineers, and that investigations of watersheds and measures for runoff and water-flow retardation and soil-erosion prevention on watersheds shall be under the jurisdiction of the Department of Agriculture. Thus the Congress established the legislative basis for these two complementary phases of the flood-control problem and placed the responsibility for developing the solutions of the two phases upon the two respective Federal agencies most experienced and best qualified in these fields.

Following the adoption of this policy, Congress in 1938 authorized a comprehensive plan of dams and local protection projects for flood control on the Ohio River and its tributaries. The Corps of Engineers has proceeded with the planning and construction work for these projects and will give us a report on their present status.

Under authority of a resolution adopted by the Senate Public Works Committee in April 1949, a total of $78,000 has been allotted to the Corps of Engineers, or approximately that, for survey work on navigation and drainage improvements on the Green River and its tributaries. Prior to 1952, $38,000 was allotted for those surveys.

In fiscal year 1952 a sum of $10,000 was allocated for survey purposes, and for fiscal 1953 an additional sum of $30,000 has been made available for like purposes. The engineers can tell us today if that is sufficient to complete the job.

With respect to the watershed phase of flood control in the valley, the Department of Agriculture has prepared, in cooperation with various State agencies, a program for water-flow retardation and soil-erosion prevention on the Green River watershed, and House Document 261, Eighty-second Congress, first session, entitled "Green River Watershed, Kentucky and Tennessee," a report on the Department of Agriculture program, was submitted to the Congress in the fall of 1951. Following receipt of that report, Congressman John Watts and Senator Underwood and I introduced in the House of Representatives and the Senate legislation which would authorize the carrying out of that program.

Representatives of the Department of Agriculture will describe and discuss the watershed program at this hearing.

The presentation of the plans for the agricultural and engineering phases of the flood-control program for the Green River Basin, together with the views and comments of the citizens and organizations of the area, will be very valuable to the Public Works Committee in the House and Senate in considering future legislation relating to the Green River Basin.

You know so often when we have discussed these various phases of the Green River Valley development, we have proceeded without all needed information. Therefore, in addition to getting material for the Public Works Committee upon which action may be taken by the Congress, this is an excellent opportunity to correct any misinformation on the entire program. In this meeting, let us not hesitate as representatives of any group to ask questions of these public officials that will clarify any phase of the Green River Valley development.

The first item on the agenda today in following out the plan of Green River Valley Development Association will be the watershed program. I would like to call on the Assistant Secretary of Agriculture, Hon. Knox T. Hutchinson, who will present the statement for the Department of Agriculture.

STATEMENT OF HON. KNOX T. HUTCHINSON, ASSISTANT SECRETARY OF AGRICULTURE

Mr. HUTCHINSON. Senator Clements, Senator Underwood, Congressman Williams, and so many others here who are greatly interested in this program, and the governor, that it requires too much time to mention all of them. I think I would have to name everyone in the audience if I named everyone interested in this work. I want to say frankly it is with a great deal of interest that I come here today representing the Department of Agriculture, and I welcome this opportunity to visit my neighbor State to discuss the problems of the Green River watershed. As a citizen of Tennessee, I suppose my interest in this watershed should be only one twenty-fourth that of you people of Kentucky, because only 4 percent of the watershed is in my State. But as a representative of the Department of Agriculture, I can assure you that my interest as well as that of the Department is much, much greater. I'm sure you all know that the Department of Agriculture has prepared a report on a survey of the Green River watershed for "runoff and water-flow retardation and soil erosion prevention."

Before discussing the Green River report, I should like to first tell you a little about Agriculture's views on watershed or river basin planning, a subject which we believe is increasing in importance in the country. Its importance has been recognized by both political parties and each has a plank in its platform on the subject.

The object of river basin planning is simply to prepare the best plan for the development of the land and water resources of a basin in the interest of the people of the basin and the Nation as a whole.

We in the Department of Agriculture are interested in river basin planning. We have been an active member of the Federal Interagency River Basin Committee from its beginning. In the great river basins of the Missouri, Columbia, Arkansas-White-Red, and New England-New York, we are conducting surveys in cooperation with other Federal as well as State agencies. Also, in the Colorado and Cumberland Basins our planning work is under way on a small scale.

The problem is, How can this job of planning be accomplished? That there is a problem is evidenced by this meeting today. Our job today is to present the interests of all groups—local, State, and Federal—in order that all phases of the problem can be considered.

To explain the Department of Agriculture's position on river basin planning, I must start at the beginning.

First of all, the land and water resources of any basin are inseparable. In nature, the primary use of water is to support vegetal growth on the land where the rain falls. Man's use of the land, in turn, controls the portion of rainfall that infiltrates and is available for plant growth. Likewise, it controls the portion that runs off over the surface of the land. It is this runoff which, if uncontrolled, provides the energy for erosion, accumulates in small rivulets, gathers more force as it grows, and causes floods and sediment damage.

On the other hand, if surface water is controlled from the point where rain falls down through the rivulets, creeks, tributaries, and main stems, it can be made to serve the people rather than destroy them and their works.

It is quite clear from this that the watershed or river basin is the natural unit of area for planning the development of land and water resources.

Many skills, many disciplines, many laws, policies, and other interests must be brought to bear on this complex job of planning a comprehensive, integrated program of land and water utilization and control. This leads to two observations.

The first is that no single Government agency—Federal, State, or local—possesses all the facilities to do the job in its entirety. Consider the scope of the planning job. It involves agriculture in many of its numerous aspects—the production of crops on the land, grazing, conservation of soil, forestry, credit where needed, education—all these, and others which are well known to you. It involves the prevention and control of floods by all means at our disposal, including land treatment, small structures, levees, channel works, and the large dams to protect the high-valued property downstream. Also involved are navigation, irrigation, pollution prevention and control, power development, fish and wildlife, and recreation.

The second observation is that, in the best interest of the public, all these phases of basin development should be combined into a single

comprehensive plan to make the best use of the land and water resources of the basin.

The skills, the scientific knowledge, the know-how, are available. The missing link is an adequate facility to coordinate these skills, authorities, and interests in developing a single integrated plan.

The Department of Agriculture subscribes to such joint planning. We believe this can be accomplished without sacrificing the advantages inherent in the present functional organization of the Federal Government. We believe also that all interested Federal, State, and local agencies should participate in the planning effort.

After approval by the Congress, each part of the over-all plan would be carried out by the agency, public or private, best qualified to do the work.

This, or a similar concept of unified planning, must have motivated the people who first sponsored this meeting to discuss the problems of the Green River Basin. They are to be congratulated.

Within the Green River Basin much has already been done toward coordinating the proposals of the several Federal agencies. Most of the credit for this goes to Kentucky State officials and individuals, also credit is due the Federal Inter-Agency River Basin Committee.

Through this committee, Federal and State agencies have reviewed nine flood prevention reports of this Department, in addition to the Green, during the past year. These reports are now under consideration by the Congress. Incidentally, we expect to submit some 40 additional reports before July, and we have surveys under way on 32 more watersheds.

I sincerely hope that the testimony here today will focus attention on any loose ends that must be tied together to unify the plans for the Green River Basin.

The Department of Agriculture's contribution to plans for the Green River was based on a survey of the watershed completed in 1950. I shall review briefly some of the watershed problems and then give you a thumbnail sketch of the proposed solution.

The Green River watershed has two major physiographic areas, the Pennyroyal and the western coal field.

The eastern part of the Pennyroyal area, about 29 percent of the watershed of Green River is a moderately rugged area of generally low-grade limestone soils. Here gully and sheet erosion are moderately severe; consequently runoff is fairly rapid. In the western part, about 19 percent of the watershed, topography is rolling and soils are fairly high-grade limestone soils. Although gully and sheet erosion are frequently severe, most of the runoff is intercepted by limestone sinks.

The lower part of the western coal field, some 13 percent of the watershed, is dominated by low hills, very broad bottom lands, and loose soils. Very rapid runoff from the hills causes moderately severe to severe gully and sheet erosion. The remainder of the western coal fields, comprising about 39 percent of the total watershed area, is rough to rolling with sandstone and shale soils. Here gully and sheet erosion are severe and runoff is very rapid.

Generally, stream channel conditions are good on the Green River and its larger tributaries. On the small tributaries, however, unstable stream banks present many difficult problems.

Agriculture has developed intensively on about 62 percent of the flood plain of the Green River.

The watershed woodlands, more than one-quarter of the area, are in poor to medium condition in terms of runoff and soil stability. This unfavorable condition was caused by fire, grazing, overcutting, poor roadways, and destructive logging practices. Much of the cultivated lands are contributing excessive runoff and are eroding seriously because they were poorly managed. At the time of the survey pastures were commonly unimproved and overgrazed.

Major floods of the Green River have been caused by moderate to high-intensity rains falling over most of the watershed area. These floods almost always occur during the winter and spring months. They often cause high damage to farm property and farm improvements on the wide flood plain lands.

Minor floods of the tributaries are caused by high intensity localized storms. Collectively, these floods inundate large areas of farm crops every year.

Investigations reveal that flood damages are increasing, even though rainfall records show a long-term consistency. Without corrective measures this trend can be expected to grow more critical.

Highest rates of runoff are from the steeper cleared uplands and the heavily overcut and repeatedly burned woodlands. At the same time, these areas offer the greatest opportunities for flood and sediment reduction by improved land management.

Sediment is deposited on the flood plains with almost every flood. Much of this is also deposited in the stream channels. The result is reduced discharge capacities of streams, channels and drainage ditches, and sediment damages to navigation, recreation, wildlife, and public health.

The total estimated average annual floodwater and sediment damage in the tributary areas of the watershed is around $5,375,000. Ninety percent is damage to crops and pastures, 7 percent to roads and railroads, and 3 percent is the added cost of water treatment caused by sediment. In the Department's report, no damages were evaluated along the main stem of the Green below the western coal field-Pennyroyal boundary. I might explain this briefly.

An agricultural program of the type usually recommended by this Department cannot stop all floods. Nor do we make claims that such can be done. A complete and balanced flood-control program requires a combination of land treatment, small structures, and the large engineering works of the type constructed by the Corps of Engineers. The watershed program, however, does reduce flooding and sedimentation. It also protects the dams downstream from sediment deposition and adds longer useful life to the structures.

After completing the study of the condition of the watershed and its flood problems, the Department of Agriculture developed a program of correctional measures. The approach was to determine the total program needed for the watershed in the interest of flood prevention and then to subtract the quantities of those measures that would be installed under the "going" programs of the Department. The reason for this should be made clear.

Starting in the last century, the Congress has passed many basic laws directing the Department of Agriculture to carry out programs of forestry, soil conservation, increased agricultural production, and other activities related to the use of our soil and water resources.

These programs have been carried out on a Nation-wide scale as rapidly as funds were available. In 1936, the Congress gave the Department the added responsibility of developing programs for watersheds in the interest of runoff and water-flow retardation and soil-erosion prevention.

These two types of programs are intimately related. Let me illustrate. If a pasture is improved for the purpose of producing more beef, that improvement also increases the vegetal cover, permits more rainfall to enter the soil surface, and reduces surface runoff and erosion. This measure, then, is a multiple-purpose one. The same is true of many of the measures proposed in the flood-prevention program for the Green River watershed.

Similarly, most measures installed to increase the production of woodland, or to conserve or protect forests, serve several other purposes. Fire protection, improved woodland management, and tree planting on submarginal land not only increase timber production but also decrease flood and sediment damage.

Terraces, diversions, farm waterways, and other cropland measures reduce erosion, increase crop production, and provide protection from flood and erosion damage. Thus these, too, are multiple-purpose measures.

To meet our responsibility under the Flood Control Act requires an intensity of work far greater than the accomplishments to date under our "national" or "going" programs. Therefore, the quantities of measures contributing to flood prevention and estimated to be installed under the going programs are deducted from the total needed program to arrive at the program recommended for flood prevention. In terms of money, the value of the "going" activities in this area is about $1,513,000 annually. This is in the Green River watershed.

Also the activities of other agencies, Federal, State, and local, were taken into account in developing the program for the Green River watershed.

The Department of Agriculture's proposal consists of two principal types or classes of measures—land-treatment measures and measures for stabilizing small watercourses.

Land-treatment measures include: The establishment of perennial vegetation, pasture development, farm ponds, wildlife area development, adequate fire control for woodlands, forest planting, acquisition of critical land areas, the management of acquired flood-control lands, farm waterways, gully-stabilization measures, and terraces and field diversions.

Closely related to these, and sometimes interdependent, are the measures for stabilizing small watercourses. These are: Subwatershed waterways, small structures for debris and sediment control, road and railroad bank stabilization, and channel improvement and streambank stabilization.

To install these measures over a period of 20 years, the Federal Government will provide educational assistance, technical services, direct aids of the type now made under the Agricultural Conservation program, and up to 85 percent of the cost of engineering works, as recommended for channel improvement.

Many of the proposed measures inherently produce large "on site" benefits to farmers and operators in the form of increased production

of crops, forage, and forest products. Usually these values are far greater than the value for decreasing flood and sediment damage. But this would be true even if all flood damage were completely eliminated in the Green River watershed. These so-called conservation or associated benefits are in addition to the flood-prevention benefits. They add justification to the program and they provide some of the incentive necessary to install the works of improvement.

For the most part, the program is to be installed on the land by the farmer or operator. He pays a substantial portion of the installation cost and nearly all the maintenance cost. He and the general public share the benefits from the program.

This calls for the utmost in cooperation between the Department of Agriculture, and individuals, local agencies such as soil-conservation districts, and State agencies. It also explains why the local people have such keen interest and are willing to share in the cost of a flood-prevention program.

The estimated cost of installing the recommended program in the Green River watershed over a 20-year period is $86,601,000. Of this cost, the Federal Government will expend $56,305,000; non-Federal public agencies, $1,270,000; and private interests approximately $29,026,000, or over one-third of the total will be private money.

The average annual estimated cost of operating and maintaining the program is $20,979,000. This is shared as follows: Federal Government, $393,000; non-Federal public agencies, $593,000; and private interests, $19,993,000, or over 95 percent of the total.

Average annual benefits from the program are estimated to be $53,355,000. Flood and sediment damages will be reduced about 28 percent, yielding benefits estimated at $1,510,000 annually. Increased production of food, fiber, and forest products, needed to support our growing population, will produce benefits of about $51,732,000 annually. The remainder of the benefits, the value of decreased maintenance costs on public roads and railroads, is $113,000 annually.

Additional benefits not evaluated in monetary terms are improvement in wildlife habitat, preservation of esthetic and recreational values, improved economic and social structure, and prevention of interruptions in transportation and communications.

Using only the benefits calculated in monetary terms, the benefit-cost ratio is 1.7 to 1. In other words each dollar expended will return $1.70 in benefits.

The Department of Agriculture's report on the survey of the Green River watershed was submitted, under Federal Interagency River Basin Committee procedure, to interested agencies for review and comments. Here are excerpts expressing the substance of some of these comments:

Corps of Engineers.—The recommended program would not conflict with any existing project of the Corps of Engineers in the basin, but coordination of detailed planning in areas of overlapping interest would be desirable when development of improvements reaches that stage. The Corps of Engineers will be pleased to consult and cooperate on these matters at any time. * * *

Department of the Interior.—* * *, a review of the report indicates that the plan is as logically based as present status of research permits and the report is commendable in that the claims made for the program proposed appear to be conservative. * * * The program proposed will benefit departmental interests within the basin, especially if opportunity is afforded the Fish and Wildlife Service to participate, should the program be authorized.

Former Governor Clements, of Kentucky.—It is the feeling of the State that the proposed program would be of tremendous value in the development of flood control and conservation of water, soil, and the natural resources within the Green River watershed. * * * I urge its early submission to Congress for consideration.

Governor Browning, of Tennessee.—The report on the Green River and the developments proposed in it has my entire approval on the part of the State of Tennessee and I commend it to you for favorable consideration.

After these reviews by the Bureau of the Budget, the report was submitted to the Congress on October 19, 1951. In his letter of transmittal, Secretary Brannan stated:

It is recommended that the program as set forth in the report be authorized for installation in the watershed.

The report was referred to the Committees on Public Works of the House and Senate and ordered to be printed as House Document 261, Eighty-second Congress, first session.

Two bills were introduced to authorize the program substantially in accordance with the recommendations contained in House Document 261. One, S. 2616, was introduced by Senator Clements; the other, H. R. 6473, by Congressman Watts.

The Department of Agriculture reported favorably on these bills. Under the Flood Control Acts, authorization by the Congress of House Document 261 is required before the Department of Agriculture may seek any appropriation to carry out the recommended works of improvement on the Green River watershed.

The proposed program is economically justified The favorable benefit-cost ratio, along with other unevaluated benefits, places it in high priority when compared with other public-works projects through the Nation.

It has been endorsed by the governors of the concerned States and by interested Federal agencies.

We have other evidence showing that the local people are willing to contribute their share of the cost, and that they are anxious to begin installing the proposed measures.

In the Green River Basin, as in most of the Nation, works of improvement on the land lag far behind the major engineering works downstream. These two aspects of basin development should be brought more nearly into balance.

Finally, it is our belief that this program can be blended into any comprehensive, unified plant that might be developed for the basin. This Department's proposal is basic to any such program because it is to be installed on the land. Minor adjustments that might be necessary in the interest of integration can readily be reconciled during the work-planning stage. During this stage details are worked out for each subwatershed.

We in the Department of Agriculture would like to see the proposed program under way on the Green River watershed.

Thank you very much.

Senator CLEMENTS. Thank you, Mr. Secretary. I know the group with you will be available for questioning at a later time. In order to keep the committee record complete, I would like to present to the reporter a letter under date of June 4, 1952, signed by Mr Frank Pace, Jr., Secretary of the Army, giving his approval of this bill.

DEPARTMENT OF THE ARMY, *June 4, 1952.*

Hon. DENNIS CHAVEZ,
Chairman, Committee on Public Works, United States Senate.

DEAR SENATOR CHAVEZ: Reference is made to your request for the views of the Department of the Army with respect to S. 2616, Eighty-second Congress, a bill "to authorize a program for runoff and waterflow retardation and soil erosion prevention for the Green River watershed in Kentucky and Tennessee.

The Department o fthe Army has considered the above-mentioned bill. The purpose of the bill is to authorize a program for runoff and waterflow retardation and soil-erosion prevention for the Green River watershed in Kentucky and Tennessee in accordance with the recommendations of the Secretary of Agriculture contained in House Document No. 261, Eighty-second Congress, first session, at an estimated cost to the United States of $56,305,000.

In a letter to the Secretary of Agriculture dated August 18, 1950, the Chief of Engineers, in commenting on the report in the above-mentiond document, made the following statement:

"The recommended program would not conflict with any existing project of the Corps of Engineers in the basin, but coordination of detailed planning in areas of overlapping interest would be desirable when development of improvements reaches that stage. The Corps of Engineers will be pleased to consult and cooperate on these matters at any time with the agencies of the Department of Agriculture."

In view of the above comment, the Department of the Army offers no objection to the enactment of S. 2616.

This report has been coordinated among the departments and boards of the Department of Defense in accordance with procedures prescribed by the Secretary of Defense.

The Bureau of the Budget advises that there is no objection to the submission of this report.

Sincerely yours,

FRANK PACE, Jr.,
Secretary of the Army.

I would also like to submit to the reporter a letter under date of June 6, 1952, from the Secretary of Agriculture, Charles F. Brannan, approving the bill:

DEPARTMENT OF AGRICULTURE,
Washington 25, D. C., June 6, 1952.

Hon. DENNIS CHAVEZ,

Chairman, Committee on Public Works, United States Senate.

DEAR SENATOR CHAVEZ: Reference is made to your request for the Department's views on S. 2616, a bill "to authorize a program for runoff and waterflow retardation and soil-erosion prevention for the Green River watershed in Kentucky and Tennessee."

The program proposed by this Department in House Document 261, Eighty-second Congress, would significantly alleviate floodwater and sediment damages in the Green River watershed. In addition, the recommended program would produce even greater benefits in the form of increased yields from open lands as well as woodland, and from decreased maintenance costs on roads and railroads. The benefits are estimated to exceed the costs in the ratio of 1.7 to 1.

Agricultural production must be maintained at increasingly higher levels without destroying or imparing the soil and water resources on which this production depends. The program was designated to accomplish this goal with a maximum degree of participation and cooperation from the inhabitants of the watershed.

We should like to call to your attention the fact that the estimated cost of $56,305,000 cited in the bill is an estimate based on 1948 prices.

This Department recommends that the bill be enacted.

The Bureau of the Budget advises that there is no objection to the submission of this report.

Sincerely,

CHARLES F. BRANNAN, *Secretary.*

And now I present under date of May 29, 1952 an unusually important letter from the Director of the Budget, F. J. Lawton, recommending enactment of S. 2616, which is the watershed bill:

EXECUTIVE OFFICE OF THE PRESIDENT, BUREAU OF THE BUDGET,
Washington 25, D. C., May 29, 1952.

MY DEAR SENATOR CHAVEZ: This is in reply to your letter of February 8, 1952, requesting the views of this office with respect to S. 2616, a bill "to authorize a program for runoff and waterflow retardation and soil-erosion prevention for the Green River watershed in Kentucky and Tennessee."

The work envisioned in the report of the Department of Agriculture for the Green River watershed, which has been printed as House Document 261, constitutes predomintly open land, farm, and woodland improvement measures which will produce very high conservation benefits, accruing mainly to land owners and farm operators in the form of increased returns due to improved practices. The program recommended appears to be largely an intensification, acceleration, and adaptation of soil and water-conservation activities already in progress under going programs of the Department of Agriculture. These include such programs as the conservation and use program, authorized by the Soil Conservation and Domestic Allotment Act, approved February 29, 1936, as amended; the Soil Conservation Service's program of assistance to districts and other cooperators, authorized by the act of April 27, 1935; and State and private forestry cooperation, pursuant to the act of August 25, 1950, sections 1 through 5 of the act of June 7, 1924, and acts supplementary thereto.

The Bureau of the Budget is in agreement with the objective contemplated in the report of accelerating land-treatment measures and installing structural measures designed to retard floods and prevent soil erosion. This objective is particularly desirable from the point of view of coordination of upstream measures with the flood-control programs of the Corps of Engineers.

The measures contemplated to implement the proposed program may be grouped into two broad categories—land-treatment measures and structural measures, the latter being shown in table 2, page 28, of House Document 261, as subwatershed waterways, gully stabilization and sediment control, road and railroad bank stabilization, and channel improvement and stream-bank stabilization. The language of S. 2616, in approving the report of the Secretary, would appear to authorize both land-treatment and structural measures under the Flood Control Act.

The Bureau of the Budget is of the opinion that funds for the installation of the land-treatment measures should be requested as additions to the going programs of the Department of Agriculture agencies carrying on similar work under regular legislative authorities and procedures and that funds for only structural measures should be sought under flood-control appropriations.

Inasmuch as we believe this bill, in its present form, would not preclude the financing of the program in the manner described above, we recommended enactment of S. 2616.

Sincerely yours,

F. J. LAWTON, *Director.*

I recognize former United States Senator John Cooper, who has just come into the room. Now I present Col. Paschal N. Strong, who will present a statement for the Corps of Engineers.

STATEMENT OF COL. PASCHAL N. STRONG, DIVISION ENGINEER, OHIO RIVER DIVISION, CORPS OF ENGINEERS

Colonel STRONG. Senator Clements, Members of Congress, ladies and gentlemen: I appreciate the opportunity of representing the Chief of Engineers at this meeting arranged by the Public Works Committee of the United States Senate and House. There are many interested citizens and organizations of the Green River Valley present on this occasion, and my brief remarks are addressed to them as well as to the distinguished members of this important committee.

We of the Corps of Engineers are no strangers to the Green River Valley as our people have been here since the United States took over the lock and dam system from the State over 60 years ago. I am sure many of you at this meeting know our employees who have been loyally trying to keep the river open to traffic notwithstanding the small amount of funds which have been made available recently for that purpose. That they have made the public's money go far, I can personally attest to, as I have seen the results of their work only yesterday, when I made an inspection of the lower river by boat.

I had the pleasure of going up Green River—I rode up the river from the mouth to lock and dam No. 4. I went through two locks built in 1833, 119 years ago. I paid silent tribute to the men of that day, who built so well that 119 years later those locks built for the traffic of that day were still holding. I thought how proud the builders of this lock would have been had they known how useful their locks were 120 years later. But that is all past history of the great, they the stepping stones to the plans of the Corps of Engineers for the future of the Green River and its tributaries, plans which we have been developing since the early thirties, and in which this meeting is interested. Perhaps I should first explain what may be in store for the present obsolete navigation system on the main stream.

In accordance with a congressional directive, which was secured through the efforts of your congressional representatives, we are studying ways and means of providing a modern navigation project for the lower Green River which will compare favorably with similar projects that have been provided by the Government to coal areas on other Ohio tributaries, such as the Great Kanawha and the Monongahela. It would surprise you to know that the Monongahela alone handles as much traffic as the Panama Canal. It taps the coal mines of West Virginia and feeds it into the industrial plants of Pittsburgh. These studies have been unavoidably delayed due to a lack of funds; but, again due to the efforts of your congressional representatives and State authorities, funds have now been made available for completion of the work, and we are getting into the details. We hope to come up with a recommendation by the end of the fiscal year.

We are now studying the relation between costs and benefits of the best plan for this navigation project. While no assurances can be given that we will find the project economically justified, things are beginning to point that way, provided the local interests do not oppose what appears to be the most economical plan of development. This involves a single lock and dam to replace present dams Nos. 1 and 2. A large coal producer, whose name I am not permitted to disclose, is considering the annual movement of some quarter-million tons of Green River coal to points on the Ohio River. While it has not been revealed where this coal will go, it is known that a combine of our large public-utilities companies contemplate the construction of several large power stations along the Ohio River, and it may be that the coal is destined for one of those stations. This will help provide the tremendous additional power required in this area by the construction of the new atomic-energy plants near Paducah and near Portsmouth, Ohio.

Formerly the design of our steam electric generating plants for efficient operation required a high-grade sulfur-free coal. It is my

understanding that the new plants of this type attain practically the same efficiency from the type of coal which is found in western Kentucky as they do from the so-called high-grade premium-cost bituminous coals of eastern Kentucky and West Virginia. So, it may be that the Green River is coming into its own industrially and, with abundant fuel and improved quantity and quality of water, may ultimately be as industrialized as the rivers to the east which are favorably situated with regard to high-grade coals and abundant water. If so, cheap water transportation will be one of the first requirements, and our survey of navigation on the Green River is studying this matter thoroughly.

Many of you here are vitally interested in our plans for flood control of the basin. The Corps of Engineers first got into the flood-control business on the Mississippi River and on the Sacramento River in California through the establishment by Congress of the Mississippi River Commission and the California Debris Commission. Up to 1927, Congress had not recognized any Federal responsibility for flood control, except on those two streams. The first recognition that the Federal Government really had an interest in these matters was the enactment of legislation in the form of the Rivers and Harbors Act of January 21, 1927, which authorized surveys of all of our important navigable waters in the interest of improvement of navigation in combination with power development, flood control, irrigation, and other water uses. Among the streams which were directed to be studied under the provisions of this act, were the Green, Barren, and Rough Rivers. The comprehensive study of these streams was initiated some 25 years ago, and since then has been pursued intermittently as funds permitted or as changing economic condition dictated.

It must be recognized that these studies were undertaken in the late 1920's and early 1930's, during the period in which the lower Ohio Valley, and particularly the Green and Kentucky Rivers had suffered their longest sustained drouth. Lands were plentiful for cropping at that time; farm and mineral products were of low value; and in consequence, as was to be expected, no additional improvement of the Green River or its tributaries was found to be economically justified in that report. However, studies did result in the development of a comprehensive plan for use as a guide for the future improvement of the basin in the interest of navigation, water conservation, and flood control. This initial plan included seven reservoirs: One each on the Rough River, Nolin River, and Drakes Creek; two on the Green River proper above Mammoth Cave; and two on the Barren above Bowling Green. The study also resulted in the development of some fairly good maps of the entire flood plain of the Green River and its major tributaries, and the initiation of stream-flow records, both of which have furnished valuable data for use in our later studies. And then the rains came.

First there occurred the great headwater Ohio River flood of 1936 in which the Golden Triangle at Pittsburgh became a lake; then the deluge of January 1937, which was centered in the Green and Lower Cumberland Basins. These great rains resulted in stages in the Ohio River 5 to 10 feet higher than any of those experienced in the past, and centered the interest of Congress on flood control in what has often been termed "The Ruhr Valley of America." Congress directed

us to come up with a plan for prevention of further catastrophic situations of this sort in the valley through review of our plans which had been presented in the so-called 308 Reports. The Chief Executive asked that an interim report be presented to the Congress that was then in session, so that some action could be taken to initiate work on the program during the next fiscal year.

The 1937 flood and its results all over the Ohio Basin are quite familiar to me, as I happened to be on duty at Cincinnati then as assistant to the division engineer. I well remember how our people worked day and night to attain the President's objective of providing him with a plan for flood control for the entire Ohio River Basin, which he could present for consideration of Congress while memories of the disaster were still fresh. During these studies we made a review of the Green River Basin.

It was at once determined that the small headwater reservoirs which we had proposed in connection with our 308 Report studies, would fail utterly in the control of the tremendous volume of water contributed by the Green to the Ohio in 1937 (over 25 inches of rain fell during the 1937 storm at points in the Green and lower Cumberland Basins). This resulted in an alternative proposal for constructing a large reservoir on the main stem with a dam at Mining City—a site which is familiar to many of you. Also, engineering and economic considerations indicated the desirability of eliminating from the plan the lower Green and lower Barren River Reservoirs, as well as the small reservoir which was formerly proposed on Drakes Creek. Thus the long controversy in regard to construction of the Mining City Reservoir began.

Many public-spirited citizens, particularly those interested in conserving our natural recreation attractions, opposed the project due to a misunderstanding concerning its effect on Mammoth Cave. However, as the Mining City Reservoir was regarded as an essential unit in the over-all reservoir plan for the Ohio and Mississippi River Basins, the corps completed its study on the desirability of the project. However, events in the past 2 years may alter our views concerning its necessity for the original purpose for which it was intended. Possibly a smaller reservoir at this site may suffice, for the following reasons.

During our study of reservoirs to provide the desired degree of flood relief on the Ohio and Mississippi, undertaken immediately following the 1937 flood, some people of Kentucky and Tennessee, including State authorities, indicated opposition to the construction of a similar large reservoir on the lower Cumberland, and although such a reservoir was considered, it was not recommended for construction. This Cumberland Reservoir, in addition to providing navigation and flood control, would develop a large block of hydroelectric power. In consequence of the advent of the Korean situation, the demand for power on the part of our rapidly expanding defense industry in western Kentucky and neighboring Tennessee brought about a complete change of attitude with regard to the lower Cumberland River project, both by State authorities and local people. The authorization of this lower Cumberland River Reservoir is now before Congress. If authorized, the reduction in flood crest that the Mining City Reservoir would accomplish at Cairo, will be achieved by this large Cumberland River Reservoir. So if we can accomplish reduction at Cairo

by the lower Cumberland Reservoir, it may be that we will not need the tremendous capacity of the Mining City Reservoir. As you know, it is reduction in the tops of floods of the Ohio and Mississippi which provides much of the benefits that justify projects like Mining City and lower Cumberland Reservoirs. Therefore, revised studies might indicate that a Mining City Reservoir of the size now proposed will be found no longer an essential unit in the Ohio River Basin flood-control plan, and that a system of smaller reservoirs which would provide flood control for a much larger area in the Green River and its tributaries, will adequately serve as a substitute.

We are ready to make such a study whenever Congress directs us to do so, either by asking for a review report or by passing legislation authorizing a preliminary examination and survey. This does not mean we are not ready to start certain improvements in the Green Valley at once. We are. Sufficient study has been made of one of these smaller reservoirs to indicate that its economics are sound; that it will fit into any plan finally adopted for the basin; and that it would be a profitable venture on the part of the United States to start its construction at the earliest practicable date. This is the Rough River Reservoir, located on the headwaters of that stream, which would provide immediately, substantial relief from floods for those fertile Rough River bottom lands, and a measure of the same type of benefits along the Green River below the mouth of the Rough. It is possible that this reservoir may be constructed so as to provide corollary benefits to low-flow regulation, stream-pollution abatement, and recreation.

As an adjunct to this resservoir, our flood-control plan for Rough River also includes channel cleaning and bank clearing for the lower 64 miles of the stream, and channel rectification for its tributary, Barnett Creek, thus providing desirable drainage for a large fertile area. The undertaking of these latter two improvements is subject to the condition that certain cooperation, such as furnishing rights-of-way, and so forth, will be provided by local interests. It appears that the Rough River area is an ideal location in which to test and determine the results and value of a complete basin-wide watershed-treatment program.

In this connection, you will hear from a representative of the Department of Agriculture on their plans for the treatment of the Green River watershed. I have read over their plan with a great deal of interest. There is nothing in the plan which will interfere in any way with the proposed works of the Corps of Engineers. On the contrary, the plan supplements our works on the main stream by a program of soil-erosion control, reforestation, and water-conservation treatment in the headwaters.

While this conservation treatment of water in the small upper streams will have little effect on the main stream floods, nevertheless it will yield measurable benefits to the land in that area, and in addition will protect the main stream and reservoirs from mud and silt. Furthermore, the long-range plan of the Department of Agriculture will result in an enhancement of the agricultural wealth in the valley which, in the years to come will greatly accentuate the need for major flood-control measures and modern navigation improvements.

In conclusion—we are ready to make a beginning in the flood control and drainage features of a basin-wide treatment in the Rough River

Valley whenever Congress makes funds available. We will soon be prepared to make definite recommendations on a modern navigation system and, provided funds are made available, we can, in a short time, bring our basin-wide flood-control plans up to date to appraise them in the light of the high dam on the lower Cumberland River and the works proposed to be undertaken by the Department of Agriculture.

I would like to put in an aside for the benefit of certain people. The Corps of Engineers are not favoring large dams. We neither favor nor disfavor large or small dams. We are only seeking the answer to flood prevention and control. From our engineering studies by competent engineers, it is only the answer which we seek. We are not committed to high or low dams—flood control in some valleys such as the great Ohio River, cannot come from any one thing. We must have some high dams to protect the tributaries and to reduce main stream floods and we must have flood walls to supplement them on the main stream, but I want you people of this group to get it out of your heads that we are committed to high dams. We are only seeking an answer to this problem. Thank you very much.

Senator CLEMENTS. I am sure Colonel Strong has opened up some subject material in the minds of many in this audience today, and before he leaves here, there will be a good many questions directed at him and other members of his staff that will clarify our thinking on several phases of the project.

Now I present Mr. A. P. Bursley who will present a statement for the Department of the Interior.

STATEMENT OF A. P. BURSLEY, UNITED STATES DEPARTMENT OF THE INTERIOR

Mr. BURSLEY. Thank you, Senator Clements. I have here a prepared statement which I have edited on the plane coming over, and which I will abbreviate today. The way Green River flood control is now authorized it may be a national program. When we say that we mean particularly the Mining City Dam, which has been mentioned by Colonel Strong.

In the act of August 25, 1916, which established the National Park Service, the fundamental purpose of the areas included in the national park system is defined by the Congress as "to conserve the scenery and the natural and historic objects and the wildlife therein, and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

Appreciation by the public of these areas is manifested by the visitation to Mammoth Cave National Park. Mammoth Cave is one of these national parks. During the period from 1946 to 1952 the increase from year to year has averaged almost 20 percent until visitation for the current year will be approximately 435,000 persons, nearly tripling that for 1946. Mammoth Cave is one of the Nation's most famous natural wonders, and is one of the outstanding tourist attractions in the State of Kentucky.

The most prized trip within the cave is that to Echo River, the lowest point reached by visitors. The water level here is but little higher than, and is governed by, the level of Green River outside the cave. I take hope from the remarks of Colonel Strong that the dam may not be

built to the height as previously discussed. Every foot that the water is lowered, will possibly diminish the damage to Echo River, to Mammoth Cave, and the Mammoth Cave National Park. Scoured out through the centuries by underground water courses it appears a winding, relatively narrow subterranean lake. At the end nearest Green River the waters find their way through crevices impassable to human beings, emerge to the surface, and flow into Green River.

Congress has authorized the Mining City Dam project only on condition that such dam and its impounded reservoir will not have any adverse effect on Mammoth Cave National Park. This qualification appropriately continues its basic instructions of August 1916, as above cited.

It is apparent that potential damage to Mammoth Cave National Park will be focused upon but not confined to subterranean Echo River. Installation of navigation lock No. 6 in Green River about 45 years ago had the effect of raising water levels in Green River opposite the cave. A corresponding rise was noted in the surface of underground Echo River. Thereafter sedimentation in Echo River became an increasing problem. Use of lock No. 6 was discontinued on August 1, 1951. Last month it was kept open for a few days, thus restoring the water level of Green River opposite Mammoth Cave to normal unimpeded conditions. Improvement in the "scour" of deposits from Echo River was definite.

The situation at Echo River is as follows: Whenever its surface rises above elevation 423 navigation of the underground pool to exhibit it to parties of visitors in boats is hampered. When it reaches elevation 428, navigation is completely impossible, boats are smashed against the cavern roof and damaged or destroyed, sedimentation is rampant. Even after the waters have receded, display of the cavern cannot be resumed until boats have been repaired and cleanup work accomplished. This may and sometimes does require weeks.

Worse yet, cleanup within the cavern does not and cannot hope to remove the cumulative mass of limestone scourings which are deposited on the river floor below limits which are never exposed. When Green River is restored to its normal undammed conditions, enhanced natural flushing of this accumulation is noted. If the water in Green River is to be retained at higher levels for longer periods in the future, processes of deposition will be accelerated and the day hastened when it will no longer be possible to exhibit Echo River to those who follow after us.

In the opinion of the National Park Service and of the Department of Interior, as far as flooding natural features in any of our national parks and national monuments is concerned, unnatural flooding is analogous with damage and cannot be construed in any other way.

The degree of adverse effect of the proposed Mining City Dam on the Echo River section of Mammoth Cave cannot be determined offhand. Too little is known about the source of the underground waters, where they pick up the sediment loads they carry in flood stages or how many outlets are still undiscovered. Accordingly, it will take more gaging stations and more scientific measurement of sediment loads and deposits to obtain even a fair estimate of the true damage to the park if the Mining City Dam were constructed.

Initial studies of this nature are now being arranged with the Geological Survey. These will take several years to complete, but are vital to a reliable estimate of potential damages. Because of its interest in the ultimate results, it is to be hoped that the Corps of Engineers will see fit to join in the data-gathering program at the appropriate time, and to assist materially in its financing.

Following this, and based upon the accumulated data, there must be a firm understanding of exactly to what dimensions the proposed dam will be built—if it is built—and exactly how it will be operated thereafter.

As publicized in June 1949 alternate plans I and II are involved. Normal water surface, under these plans, might be at elevations 378 or elevation 420 or between these limits. Allowance for flood control would be above the finally designated normal level. Under either plan release of flood waters through the dam would be limited to a maximum of 40,000 cubic feet per second. During periods of extreme flood stages in the Ohio River no water at all would be released through the Mining City Dam.

Obviously, there can be no determination of potential damage to Mammoth Cave until the design and plan of operation for the proposed Mining City Dam have been crystallized. The National Park Service will be happy to learn from the Corps of Engineers just what its plans contemplate. More than that, it will be glad to advise with the corps in a preliminary way and subject to later full data on underground conditions, as to the probable effects of various designs upon Mammoth Cave.

Colonel STRONG. We welcome the invitation.

Mr. BURSLEY. The Department of the Interior, including the National Park Service, approaches the problem with open mind. It hopes, sincerely and humbly, that the Corps of Engineers may be able to arrive at a solution which can be demonstrated in advance of construction, fully and acceptably, as without adverse effect upon Mammoth Cave National Park. It does not believe that plans for the Mining City Dam, as they are not understood, can be so demonstrated. Failure to require such assurance would constitute disregard of the mandate imposed by the Congress in 1916 and disservice to the citizens of Kentucky who have entrusted Mammoth Cave to the Federal Government for safekeeping. Thank you.

Senator CLEMENTS. Thank you Mr. Bursley.

Now I would like to present the Governor of Kentucky, who in turn will present Commissioner of Conservation Henry Ward.

STATEMENT OF HON. LAWRENCE W. WETHERBY, GOVERNOR OF THE COMMONWEALTH OF KENTUCKY

Governor WETHERBY. Thank you, Senator Clements, guests, ladies, and gentlemen. I want to take this opportunity, before I present these folks for the State of Kentucky in this problem, to thank those present for coming here, to the League that invited us here, to Senator Clements, Congressman Watts, and Senator Withers for making it possible to have us here in this area. We all are interested in the development of the Green River Valley. There are lots of prospects in that development and answers too. You have heard discussed here

some very pertinent points that I am sure you will want to discuss with the colonel and his corps, and with all the witnesses. We are delighted to have you with us, and welcome your presenting all the problems dealing with the development.

At this time, it gives me great pleasure to present the commissioner of conservation of Kentucky in whose department are all agents dealing with the problem.

STATEMENT OF HENRY WARD, COMMISSIONER OF CONSERVATION, COMMONWEALTH OF KENTUCKY

Mr. WARD. Senator Clements and distinguished guests, I am merely going to present you a brief statement. We have with us a number of State officials who are very much more expert witnesses than I who have prepared statements which I would like to have the opportunity to submit for the record.

STATEMENT OF R. B. DIEHL, CHAIRMAN, KENTUCKY FLOOD CONTROL AND WATER USAGE BOARD

My name is Orville Chinn. I am director of the Flood Control and Water Usage Board of the Kentucky Department of Conservation. I am here today at your invitation, representing the board to testify in favor of the United States Department of Agriculture's watershed treatment program as contained in Senate bill S. 2616, introduced by Senators Underwood and Clements, and House bill H. R. 6473, introduced by Congressman Watts.

This program, in a survey report form, was presented by the United States Department of Agriculture to our board for its study and official comment in July of 1950. After careful study and investigation, the board voted unanimously in favor of the program, and instructed me to write the following letter:

DIVISION OF FLOOD CONTROL AND WATER USAGE,
Frankfort, Ky., July 24, 1950.

Mr. HENRY WARD,
Commissioner of Conservation, Frankfort, Ky.

DEAR MR. WARD: In compliance with Kentucky State law, the flood-control and water-usage board has reviewed the survey report of the Green River watershed, Kentucky and Tennessee, submitted by the Office of the Secretary of the United States Department of Agriculture.

The board finds that investigation of the watershed has revealed serious damages from floodwater, soil erosion, and sedimentation. The sources of these damages have been determined and a program for their correction has been recommended.

The recommended program consists of several interrelated and interdependent measures for both flood control and conservation of watershed lands that will function to conserve soil and water, accelerate infiltration, reduce runoff, and increase soil fertility.

This program is scheduled to be completed during a 20-year period at an estimated cost of $56,305,000 to the Federal Government and $30,296,000 or its equivalent to local interests.

Because of the apparent, urgent need for a program of this character in the watershed, it is the opinion of the board that this survey report be submitted to Congress for authorization and appropriation as speedily as possible so that the application of these remedial practices can be started.

Yours very truly,

R. P. DIEHL,
Chairman, Flood Control and Water Usage Board.

Since writing that letter on July 24, 1950, I have spent considerable time in the Green River watershed and I have noted carefully the deplorable condition of the smaller tributary streams, so choked with silt and various types of debris as to be unable to properly drain the adjacent lowlands and flooding these same lowlands, destroying growing crops and scouring away valuable topsoil with almost every rain. Farmers, in despair, have been forced to abandon large acreage of this bottom land because of too frequent flooding and

improper draining. Uncontrolled water, rushing from where it falls on the land to the nearest small stream, carrying with it hundreds of thousands of tons of valuable topsoil which it deposits in these streams, is the cause of this condition. Lower income for the farmer and a disrupted economy for the entire valley is the result.

The acute shortage of water for use in the Green River watershed this very year, due to drought, was and is most serious to individual farmers, municipalities, and small industry. This program as proposed will do much to alleviate the hardships of all in subsequent dry seasons.

The objectives of the recommended program are the reduction of floodwater damages and the conservation of the soil and water resources. The measures that will accomplish these objectives are included in the program and are effective and sound.

Therefore, for myself and the flood-control board, I urge the Public Works Committees of both the House and the Senate report these bills favorably, and urge their passage and the appropriation of funds that this much-needed work can start at the earliest moment.

STATEMENT OF O. W. CHINN, DIRECTOR, DIVISION OF FLOOD CONTROL AND WATER USAGE

My name is Orville Chinn. I am director of the Flood Control and Water Usage Division of Kentucky. I am here today, at the invitation of you and the people of the Green River Valley of Kentucky, to testify in favor of the United States Department of Agriculture's watershed-treatment program, as contained in S. 2616, introduced by Senators Underwood and Clements, and H. R. 6473, introduced by Congressman Watts.

I was born in the Green River Valley. I remember the river 35 years ago when it was considered a clear-water stream. Now the river is so muddy and silt-laden that it costs $183,000 annually to filter the sediment out of that small portion of its waters that are necessary for municipal use. I have watched with alarm and apprehension the gradual deterioration of the river and its tributaries over a 30-year period. I have watched the river during many of its floods. I have talked with farmers and walked over their bottom lands when the July floods had destroyed their crops too late in the season for replanting, thereby wiping out in a few hours the results of a year's planning and labor. I am familiar with most of the many problems facing the valley.

The resources of the Green River Basin are its soil, coal, gas, oil, water, and its people.

It is steadily losing all these, except the water. The tremendous soil loss that has occurred has left over 500,000 acres of land idle and abandoned. The people have left these lands and migrated elsewhere. A population check of the lower 13 counties over a 30-year period shows a loss of 124,472 people.

An average of 46.5 inches of rain falls on the valley annually, although this total sometimes exceeds 60 inches. An average of 18 inches of this rainfall rushes down the Green to Ohio, carrying a heavy load of silt scoured from the farm lands of the valley.

Already this surface runoff has removed the topsoil completely from one-fourth of the Pennyroyal, leaving over 700,000 acres without surface soil. In the western coal field the surface has been removed from over 900,000 acres. The rapidly eroding subsoil remaining is now contributing a poor-quality sediment which spreads over the bottom lands in the lower valley, in many instances covering what was once good land with a blanket of infertile silt.

To see the results of the economic decay caused by this soil loss, one needs only to look at the abandoned homesteads in the valley with farm buildings falling into ruins, and the gullied fields that once supported a family, now sparsely covered with briars, weeds, and a low-type vegetation. The owners of these idle acres will often be found in northern Ohio, Indiana, or Michigan, where they are now buyers instead of sellers of farm products.

In the headwater areas of Lincoln and Casey Counties the denuded knobs produce a high rate of runoff and frequent severe flash flooding of the tillable bottom lands. This area also produces a concentration of heavy-erosion debris of shale particles and gravel, which fill the stream channels, further aggravating the flood problems of the area. It was in this area that two people lost their lives in the March 1952 flood. The same flood claimed seven lives in Allen County.

Further downstream in the rolling and karst lands of the Pennyroyal, severe erosion has taken place in the areas drained by surface streams, and also in the region where subsurface drainage is predominant. In this sinkhole region many special problems are encountered. The severe erosion in this karst area is removing the topsoil from the slopes and depositing it in the depressions and underground streams. The accelerated deposition of sediment in the Echo and Styx River passages of Mammoth Cave is one of the results of this karst-land erosion.

The western coal field area, comprising 52 percent of the Green River watershed and covering an area of over 3,000,000 acres, has been ravaged by erosion on the uplands and floods in the lowlands. Hardly an acre of hill land remains that has not suffered from erosion, and less than 27,000 acres of class I land can now be found in the area.

The bottomlands of Caney Creek, Barnetts Creek, and many other small tributaries have been rendered practically useless because drainage outlets are filled with silt. The bottomlands along Rough River, Panther Creek, Deer Creek, and many of the larger tributaries can be depended on for only about one or two crops every 5 years. The main stem of lower Green River frequently floods during June or July, causing nearly complete crop loss. This area was inundated for 51 days continuously in 1950. The lower area of the Barren River has a record of 35 damage-producing floods in 10 years. Pond River suffered 53 floods which caused damage during a 13-year period. The floods in the Pond River and Lewis Creek areas also spread copperas waters over the croplands and woodlands, causing additional and lasting damages to soils, crops, and timber.

The people in the watershed are almost unanimous in their request for aid for flood control and water conservation.

This summer season of 1952 has been one of deficient rainfall in the valley, and the President has declared Kentucky to be one of the drought-disaster States. Many farmers in the Green River Valley were forced to sell their livestock for lack of forage and water. This could have been prevented to a great extent by an adequate water-conservation program and by use of supplemental irrigation.

In addition to the serious need for erosion control and water conservation on the uplands and smaller tributaries, a storage space for 5¼ million acre-feet of water is needed to control floods on the main stems of the river and tributaries. The Department of the Army has an authorized plan which will provide the needed storage. The Department of the Army and the Department of Agriculture are in complete agreement on their coordinated program for the valley.

We believe that the program for watershed treatment as outlined in S. 2616 and H. R. 6473 is one that will pay back nearly $2 for each one spent, will help to check the devastation of erosion and floods, and will halt the economic decay of the basin. If we wait too long, however, conditions may reach a point where we cannot restore these lands and streams to a reasonable degree of usefulness.

The division of flood control has received many requests for assistance from businessmen and farmers throughout the valley, who feel that the situation has gotten beyond their control and has gone too far for individuals and small groups to handle.

On the basis of the evidences presented, and in behalf of these many people requesting assistance under this program, we wish to urge that your committees give favorable consideration to the authorization of this program at an early date.

STATEMENT OF M. W. QUALLS

My name is M. W. Qualls, director of the Division of Soil and Water Resources of the Kentucky State Department of Conservation, Frankfort, Ky.

I am speaking in support of H. R. 6473 and S. 2616, introduced in the Eighty-second Congress, referring to the inauguration of specific and intensified flood control and conservation practices in the Green River watershed of Kentucky and Tennessee.

The chief function of our division, working under a nine-man commission of soil-conservation district supervisors, is to render promotional and educational assistance to the 120 organized soil-conservation districts in Kentucky in accelerating the application of soil- and water-conserving practices to the land.

It is indeed a pleasure and an honor to have this opportunity to make a brief statement in support of a basic program which is not only essential to the economy of the Commonwealth of Kentucky but the Nation as a whole.

Although considerable progress has been made in conserving our land and water resources through existing programs of the United States Department of Agriculture, in the past, we must face the fact that we are still losing our soil at a faster rate than it is being conserved. With our ever-increasing population at the average rate of approximately one-quarter of a million people each month, and with our natural resources—particularly our topsoil—being expended through erosion at an alarming rate, it is basic to the laws of nature that such cannot continue to exist throughout the years ahead.

We feel that H. R. 6473 and S. 2616 provide for an intensified approach to the necessary watershed treatment which will, in addition to the reduction of floodwater damage, provide the medium through which soil- and water-conserving practices can be established at a rate that will greatly improve the economic conditions of all of the inhabitants of the watershed.

Of course, we recognize the fact that a program of this nature cannot be carried out by the Federal Government alone. We know that the State government has a responsibility, and local organizations, such as soil-conservation districts who are representing the landowners within their area, have a very important role to play in getting the program accepted by the landowners themselves. It is this in particular with which I wish to extend my comments.

Two years ago the soil-conservation district supervisors in the Green River watershed of Kentucky and Tennessee organized the Green River Watershed Flood Control Association for the purpose of studying, promoting, and educating the landowners of the area to the provisions of such assistance as included in these bills now before your committees. We are of the definite opinion that the soil-conservation supervisors in the Green River watershed understand their responsibilities in this program and are ready for action. We, of the division of soil and water resources of the State government, are ready to assist in every manner possible in promoting this program.

We have no fear, as some may have, of this proposed watershed-treatment program as being a program that will take away the rights of local landowners. We feel that the following provision of these bills protects that interest:

"The recommended measures will be installed on non-Federal land under cooperative arrangements with State and local governments, soil-conservation districts, or other agencies acceptable to the Secretary of Agriculture."

We urge the immediate passage of H. R. 6473 and S. 2616 and feel that we in Kentucky are ready to do our part to prove that, through the cooperative efforts of the Federal, State, and local governments, we can set a pattern for an economically sound approach to the treatment of river watersheds that has, as yet, never been accomplished in our Nation.

STATEMENT OF AUGUSTUS THRELKELD

My name is Augustus Threlkeld. I am president of the Kentucky State Association of Soil Conservation. I am appearing today on behalf of the 120 organized soil-conservation districts in Kentucky, comprising a total of 117½ counties of the State's total of 120.

My statement is in support of and supplementary to those made by the chairman of the Green River Watershed Flood Control Association in support of H. R. 6473 and S. 2616, introduced in the Eighty-second Congress, referring to the development of the Green River watershed in Kentucky and Tennessee.

These bills, which are now being studied by the Public Works Committees of the House and Senate, in our opinion, will help to do the very things in soil and water conservation which our soil-conservation districts have advocated and worked for since the inception of the district program. It is basic to the whole conservation program in conserving the land and water resources to have a program to cover the whole watershed of the river.

Some of the practices included in this bill are already authorized under the Soil Conservation Act. We believe they should be reauthorized under this Flood Control Act because they are just as essential to a good flood-control or water-conservation program as they are to a soil-conservation program. These two programs are inseparable.

The soil-conservation districts covering the watershed of the Green River are organized and ready to carry out in full the district program on the Green River. We urge the passage of this bill. It will be of the utmost good for the Green River area and the State at large to have this project go forward with-

out further delay. Surveys have been made. The farmers are organized and ready for action. Our resources will be enhanced and preserved by the passage of this bill.

STATEMENT OF D. B. WILLIAMS, CHIEF, FIELD SERVICE DIVISION, AGRICULTURAL AND INDUSTRIAL DEVELOPMENT BOARD

My name is Durward Williams. I am chief of the Field Service Division of the Kentucky Agricultural and Industrial Development Board. My board is concerned with the agricultural and industrial development of all sections of the Commonwealth. The board has not considered S. 2616, introduced by Senators Clements and Underwood, and H. R. 6473, introduced by Congressman Watts, in formal session. This statement, therefore, is not an official statement of the board.

The board is deeply concerned with the economic condition existing in the area comprised by the Green River watershed. In the course of our negotiations with industries interested in industrial location, the major factor today is the presence of an abundant and firm supply of water. The fact that this is of prime importance is pointed up by the preponderance of industrial development along the streams of Kentucky where an abundant and firm supply of water, suitable for industrial uses, is present. Several such industries have investigated possible locations in the Green River Valley but have located elsewhere—some in other sections of the State and others in other areas. The Green River Valley scores high in most location factors: excellent sites; good rail-transportation facilities, both east-west and north-south; a rapidly developing network of good highways; and an abundant supply of intelligent native labor. When water is considered, however, river records show two undesirable extremes—excessive runoff with costly floods, followed by seasons of low water which threaten existing industry and municipal water supplies of cities and towns in the valley.

It is believed that the program of watershed treatment proposed by the United States Department of Agriculture and contained in S. 2616 and H. R. 6473 will be of great benefit to the valley as a whole. It is further believed that this program follows the best principles in the field of soil and water conservation in that the fight begins at the source where the water falls and erosion begins.

The board in other instances where area problems have been considered has taken the attitude that over-all development in an area is most desirable. It is the board's aim to encourage and assist in any movement which will add to the economy of the State and promote the over-all good of the people of the State.

Mr. WARD. It is my privilege to bring to you a little bit of the background or explanation about the role the State government has in this whole picture of flood control and water usage, and particularly to clear up, if there is any misunderstanding, our position as it exists today.

Prior to 1948 there was no agent in the State government charged with the supervision of flood-control matters. Congress sought the help of the Corps of Engineers and other Federal agencies who desired to conduct flood-control investigations and present their plans to the State commissioner to ask for review and comments on the question. The practice then was for the Governor to distribute such plans among the various agencies such as State highway and others that might have an interest in the matter, and to be reviewed in that way. It was felt that there should be some specific State agency which would concern itself on a full-time basis with the whole problem of flood control. So in 1948 the Governor then, Senator Clements, Lieutenant Governor Wetherby, it happened that I was a member of the State senate at that session, recommended and we passed an act establishing the flood-control and water-usage division. They placed that division in the department of conservation. Other agencies of the State which concern themselves primarily with conservation and development and

proper utilization of our natural resources are located in that department. We have there the division of forestry, which certainly is interested in flood control, and flood control ought to be interested in the role of forestry. We have the division of soil and water resources, which concerns itself with the matter of soil erosion, in bringing back our soil resources. We have our flood-control and water-usage division, which concerns itself not only with flood control but also with uses of water for municipal and industrial purposes. We also have a program with which I am more intimately associated, water-pollution abatement and control, which works with the entire Ohio Valley Commission, of which I am now chairman, and through our Kentucky Pollution Commission, of which I am also chairman. We have many activities there which directly are involved in the whole matter of flood control.

We all feel that the portion which the State ought to take in thinking in terms of flood control isn't necessarily a flood-control law for the proper use of one of our major resources of water. Kentucky, because it has more miles of navigable streams than any other State, has a real resource in its water. Its proper control certainly will redound in many benefits to the State of Kentucky. So, in approaching the entire problem in our department, we might think in terms of water as a resource which not only needs control but should be used properly. That is one thing that, through the program of the flood-control and water-usage division, in the development of our program which we want to recommend to the Federal Government and other agencies, we are thinking in terms of all phases of water as a resource. It is the duty of the flood-control and water-usage division to study the full water- and flood-control program, and to represent on behalf of the State government and the people of Kentucky the thinking and consideration of the proposed projects. There is a board in the division, a nine-member board appointed by the Governor, representing all these areas in Kentucky and from all walks of life, from industry, farmers, businessmen—every phase of economic life is represented on this nine-man board. When recommendations are made by the staff of this division, all the available information is turned over to the board at a hearing, the board adopts the recommendations, which are passed on to the Governor for submission to Congress. That course has been followed in case of the watershed program as proposed by the United States Department of Agriculture, and the State of Kentucky is officially on record as recommending the adoption of a bill that is now pending in Congress.

We are here today in an official capacity to speak on that particular program. We have a very great interest in these other matters, of course. It so happens that some 2 or 3 years ago I was appointed by the then Governor Clements a member of a committee which we understood was going to make some investigation of the effects of the proposed Mining City Dam on Mammoth Cave. I have never been notified of a meeting of that committee, but I am willing to serve if that is still in existence and to do everything we can to find out what the actual facts are.

We are not in an official position today to make any comments pro or con on the Mining City Dam or any other phase of the development of Green River. We are in a very definite position to recom-

mend the early enactment by Congress of the authorization and appropriation of the watershed program as recommended by the Department of Agriculture.

I would like to go back and give you a brief history of our participation in that program. One reason I want to do this is to show you the value of what was done in 1948 and the value of this division of your State government. When that division was set up, we began investigation of the whole subject matter. We found that very few people knew anything about a program by the Federal Government, through the Department of Agriculture, to do what we call an on-the-land flood-control type of work. One reason was that Congress hadn't been spending very much on it, and it soon developed that most of the money—I would say practically all of the money—was going into those States represented on the Flood Control Committee of the House and Senate—members who, because of their position, had a close knowledge of what was available, so to this end they saw that their areas got the benefit. The result of it was, because at that time Kentucky did not have a representative on that committee, Kentucky didn't get any money out of this fund. Our efforts were turned toward trying to get some interest in that particular program in Kentucky, in getting the surveys made which were necessary before a report could be submitted to Congress and before authorization of a specific project could be requested. It so happens that Green River was selected as the basin on which the first report was to be completed for two very good reasons. One was the Soil Conservation Service, which was charged with the responsibility of making the survey in this area, had already done some work in the Green River Basin and was in a fine position to complete the study in this basin first. The other reason was that of all the basin areas in Kentucky there seemed to be more widespread interest in doing something about the Green River than in any other area.

It is a tribute to the people in this area down here that you have shown the interest you have in the problems in your basins. I would like to suggest to all other areas in Kentucky that if you want to get something done on this problem that you ought to get organized the way these groups are down here and fight for the things that you want; that is the way to get things.

That is the reason that the Green River report was finished first by the Soil Conservation Service and the first one to reach Congress in the complete form as it is. Since that time other reports have been completed, one on the Kentucky River, for example.

While I am reviewing briefly the role of the State government's position I would like to call attention to the fact that reports have not been made, studies have not even been, or for practical purposes started, on some of the other streams where they definitely ought to be done. Mr. Secretary, I would like to say publicly that I think if anything can be done to make it possible for the Forestry Service to expand and go a little faster on the upper Cumberland it certainly ought to be done for a very good reason. The Corps of Engineers are away along on their program for development of the Cumberland River, not only in terms of actual terms of a major project but in terms of completing pretty definite plans for the entire river basin.

A similar type of study which has been made for the watershed program on the Green River has not been completed on the Cumberland. And as a result a considerable amount of damage from siltation and other forms of that sort has occurred from failure to develop what we call on-the-land type of flood control.

We have had enough experience in a small way in our own department to know the value of control of the soil above the reservoir area. We have a little dam we built at Natural Bridge State Park. The little lake has been rapidly silting up because of the lack of control of the water as it falls on the land in the little reservoir area up there. That is one of the very major reasons why the State of Kentucky has been perfect for this watershed program, one reason why we have been putting so much emphasis on it. Cooperation between the organizations, the TVA and other organizations over parts of Kentucky, have been better organized over the period of years to advance the program to get action from Congress and the Department of Agriculture, which has not been as organized as it once was. For those many reasons we are able to appear before the committee today; for this year, as far as the State record is concerned, we made a thorough study of the watershed program and feel, as the Department of Agriculture feels that, to bring any benefit to the people of Kentucky and the State of Kentucky and the lower areas, we are very, very much in favor of its advancement.

We are forgetting one phase of the department of conservation's interest, and that is the division of forests, which is also in that department and is keenly interested in what Colonel Strong mentioned—the matter of recreation. Certainly we will find that this program will play a definite part in the additional recreational opportunity for the people of Kentucky and for those that care to visit the State. Mr. Chairman, I appreciate this opportunity. I would like this afternoon, if possible, to present some witnesses on behalf of the State government for a more detailed statement.

I thank you.

Senator CLEMENTS. I hope that there will be an opportunity this afternoon to present those witnesses. Certainly all priority should be given in the question-and-answer period to those of our guests from outside our State. There are many questions I want to ask the engineers and a good many questions I want to propound to the Department of Agriculture.

Mr. Harding.

Mayor HARDING. Mr. Chairman, I would like to take a brief moment to present for the record a copy of the mailing list to whom were issued invitations. At this time we want to present this for the record, also the list of the groups represented here today that is in the process of preparation. I also want to read a telegram that I overlooked from Congressman Chelf:

"Deeply regret inability to attend——"

Senator CLEMENTS. Let them be filed. I now present J. E. Wood, executive committeeman of the Green River Valley Citizens League, who will speak on the social aspects of the over-all program for the development of the Green River watershed.

STATEMENT OF JUDGE J. E. WOOD, EXECUTIVE COMMITTEE, GREEN RIVER VALLEY CITIZENS LEAGUE

Mr. WOOD. Mr. Chairman, distinguished guests, members of the Green River Valley Citizens League, ladies and gentlemen, I wish to discuss with you as briefly as possible some of the social aspects of the over-all program for the development of the Green River watershed. I am grateful for this assignment, for I appreciate the opportunity of dealing with my fellow man and of working for him. As far as my personal inclinations are concerned, I had rather mix people than concrete; I had rather deal with strength of character than with strength of steel. I had rather listen to the sound of a friendly voice than the clatter of an air hammer or the cough of a steam engine. I do not qualify these statements, and I make no apology for them. The simple truth of the matter is that I love my people and my people have been mistreated.

If I were listing the natural resources of the Green River Valley, the first one I would name would be our people. Our people constitute a natural resource that is more important than coal and water, more important than oil and gas, than soil and limestone—our people who plan together, think together, and work together to utilize the other natural resources. I am most happy to observe that the present trend of thinking in the entire Green River Valley continues to reflect a greater and greater togetherness on the part of our people. The Green River Valley Citizens League has been in contact with different groups in all the counties of the valley. We feel that there is now a friendly understanding among all our people. That their objective is for the over-all good. There is no disposition on the part of any group in any county to exploit the resources of the Green River Valley for its own selfish end. No one county in the valley proposes to take an advantage of any other county. On the contrary, the general objective is to attain the greatest possible good for the greatest number of people.

Let me assure you that I do not lose sight of the fact that, in order to keep our people well, happy, prosperous, and secure, it is necessary that we carry forward our program of conservation and development of other resources. It is necessary that we give thought to flood control, to drainage, to reforestation, to water usage, to water transportation, and to our over-all industrial development. In this connection, may I quote briefly from the Paley report to the President by his Materials Policy Commission:

> The question, Has the United States of America the material means to sustain its civilization? would never have occurred to the men who brought this Nation into greatness as the twentieth century dawned. But, with the twentieth century now half gone by, the question presses, and the honest answers are not glib.
>
> The United States, once criticized as the creator of a crassly materialistic order of things, is today throwing its might into the task of keeping alive the spirit of man and helping beat back from the frontiers of the free world everywhere the threats of force and of a new dark age which rises from the Communist nations. In defeating this barbarian violence, moral values will count most, but they must be supported by an ample materials base. Indeed, the interdependence of moral and material values has never been so completely demonstrated as today, when all the world has seen the narrowness of its escape from the now dead Nazi tyranny and has yet to know the breadth of which it will escape the live Communist one—both materialistic threats aimed to destroy

moral and spiritual man. The use of materials to destroy or to preserve is the very choice over which the world struggle today rages.

And may I quote briefly from the Paley report:

So well have we built our high-output factories, so efficiently have we opened the lines of distribution to our remotest consumers, that our sources are weakening under the constantly increasing strain of demand. As a nation we have always been more interested in sawmills than in seedlings. We have put much more engineering thought into the lay-out of factories to cut up metals than into mining processes to produce them. We think about material resources last, not first.

And now may I get back to my people: In the Green River Valley our people have been shamefully neglected. We have neglected them; the State of Kentucky has neglected them; and the Federal Government, being so far removed from our social problems, has neglected them, too. I call upon you to bear witness that we in the Green River Valley have committed the most heinous crime in the annals of history, the enormity of which has stained with an indelible smear an otherwise unblemished page. I admit to myself, in the presence of this assembly, that we have driven our children away from home. What do you say to a high-school graduate in the Green River Valley? What can you say? I'll tell you what you say, and it goes something like this: "Congratulations; I am mighty happy for you; and I am sure your parents are very proud. When do you expect to be leaving, and where do you think you'll go?" We admit to ourselves and to them that we have provided nothing to keep them at home—that, through our own lethargy and inaction, we have sacrificed them on an altar of indifference.

We are still in the grim business of exporting youth. We seem to have plenty of seed and enough soil for their germination, but the seedlings continue to transplant themselves in areas where the ground is more fertile. The Green River Valley has become a vast spawning ground for the population of deeper waters. Our 10 valley counties continue to export brilliance of intellect; strength of character; the imagination of youth; the determination of young manhood; the culture of young womanhood; in fact, the very lifeblood of our society.

In proof of the foregoing declarations, I offer the following facts: The Bureau of the Census says that my home county of Muhlenberg in 1910 had a population of 28,600—that in 1950 Muhlenberg County had a population of 32,200. These two figures would seem to indicate that in a period of 40 years Muhlenberg County gained 3,600 people.

Even if those figures were reflective of the whole truth of the matter, they are certainly not impressive. Unfortunately for Muhlenberg County, these figures do not reflect the entire truth. I call your attention to the fact—and I am now quoting the bureau of vital statistics—that during the 40 years 38,000 people were born in Muhlenberg County and only 16,000 died. What happened to the 23,000? You know what happened to them. They left Muhlenberg County because some other county outside the Green River Valley gave them an opportunity they didn't have here. I say to you gentlemen that we sent them away just as surely as if we had tied a shipping tag around every neck. Instead of gaining 3,600 people in 40 years, Muhlenberg County actually lost 19,449.

And what happened to Ohio County during that 40 years? Ohio County in 1910 had 27,600 people. In 1950 the Bureau of the Census

says Ohio County had 20,700. This represents a loss of 6,900. When we add to this figure the excess of births over deaths in Ohio County in those 40 years, we are slapped in the face with the staggering truth that Ohio County lost 19,171 people. In the same manner—and will you please permit me to quote these figures in round numbers—Webster County lost 13,600; Hopkins County lost 11,700; Edmonson County lost 9,300; Daviess County lost 5,200; Butler County lost 12,300; McLean County lost 9,600; Henderson County lost 6,200; and even Warren County lost 1,300.

Gentlemen, do you dare take a look at the total loss for the Green River Valley? I promise you that it is a staggering one indeed. The 10 counties in our Green River Valley during the 40 years from 1910 to 1950 lost 107,869. I do not admit any percentage of error in these figures, for they are taken directly from the records of the Bureau of the Census and the bureau of vital statistics. More comprehensive population figures are included in my brief. Mr. Chairman, I request permission to file the brief as a part of my presentation.

Senator CLEMENTS. Let it be filed with the committee.

Mr. WOOD. By way of contrast, I wonder what happened in Jefferson County during this period, and I wonder what happened in Fayette County. The same records indicate that Jefferson County gained 142,613 and that Fayette County gained 48,882. Those two counties gained 191,495, and the Green River Valley provided 56 percent of them.

And what happened to the people who stayed in Muhlenberg County? A few of them did stay, after all. Out of a 1950 justified population of 50,000, we have an actual population of 30,000. Thirty-six hundred of our twenty-three thousand stayed here, and to what avail? I quote the Greenville Leader of July 17, 1952:

> Muhlenberg County ranked eighty-seventh among the State's 120 counties in per capita income for 1951.

This estimated figure was reported in Kentucky Business, a monthly publication of the Kentucky Chamber of Commerce. The report showed that the per capita income for Muhlenberg's estimated 32,400 residents in 1951 was $377. The good people who lived in Muhlenberg County in 1951 had an average annual income of $377, a few pennies more than a dollar a day, barely enough to feed a Pekingese.

The average annual per capita income for Butler County during the same period was $355; for Hopkins County, $438; and, for Ohio County, $481. Only two counties listed in the Green River Valley were able to reach the average per capita income for the State of Kentucky.

The situation a man can see and feel with the greatest clarity, with the keenest insight, and with the most vivid comprehension is the situation which he himself has experienced. My own position here is unique in that I have experienced the very situation I have attempted to bring to your attention. It goes back to my boyhood in one of Muhlenberg County's coal-mining towns, back to the days when, in our limited scheme of things, coal was king. Back to the days when we lived coal; thought coal; breathed coal; and, when the wind was wrong, ate coal. Back to the days when you couldn't see the hayseed in my hair because of the coal dust. I have never had occasion, incidentally, to be ashamed of either, but I still remember the grim un-

certainty, the feeling of lost security, and the stabbing pangs of apprehension we experienced when the whistle didn't blow three times and old king coal hit the bottom, when spinning wheels stopped turning, when smoldering fires were pulled from cooling furnaces, when belts were tightened, and when erstwhile dancing eyes became shadowed with a somber uneasiness, when you wondered if you could go to school that fall, when you sought grimly for a job that wasn't there. How could there have been a job? Every job depended on coal, for coal was king.

Gentlemen, it is my earnest hope and fervent prayer that we may be able to make a more stable monarch out of old king coal, that we may be able to stem the swirling floods that sweep away within a few hours a farmer's work of a lifetime, that we may be able to make available to our country's markets the unlimited resources of our Green River Valley. Our very economy is tottering; our very security hangs on the brink of the static precipice of indifference and inaction. With all the sincerity in my soul I solicit your understanding and your assistance in awakening our dormant valley to the dynamic agricultural and industrial life which should be ours. Please help us to stop transfusing other areas with our own life's blood. Please help us to keep our children at home. Thank you.

Senator CLEMENTS. I now present Col. Wayland Rhoads, who will speak on the Green River watershed conservation program.

STATEMENT OF WAYLAND RHOADS, UNITED STATES DEPARTMENT OF AGRICULTURE

Mr. RHOADS. A nation cannot become permanently great unless its greatness is based in part upon the welfare of its agricultural element. This Nation is now great. Our desire is that it shall remain great and become greater.

The assembly of people here today is to coordinate a program so that the Green River Valley will be a much more progressive area.

In the past 8 years I have seen something of four continents. In the Near East and Middle East I saw many millions of acres that are now bare and rocky that once were covered with good soil and forests and grainfields. Man has brought about their destruction by improper use.

Within 400 years of the time Rome became great under the Caesars the land became so thin around Rome and in all Italy that it would not support its population. The capital of the Roman Empire was then moved in A. D. 330 to Byzantium on the Bosporus and the name changed to Constantinople.

Greece was very great in the time of Pericles and Alexander. The soils and forests were later depleted or destroyed. Now Greece is mostly a rocky land, and overpopulation is a great problem, for much wasted land furnishes little support.

The Middle Eastern areas of Syria, Transjordan, Lebanon, and Palestine once had much larger numbers of people than now. The erosion of the land in the last 3,000 years has made it difficult for reduced numbers of people to now live there.

The United States has depleted land and forests in the last 100 years faster than any area of equal size in the world. The soil-conservation program is now working hard to reverse this destruction

where it is put into practice. No program is more important for the future welfare of America than its soil-conservation program.

The ACP and soil-conservation programs have already been very valuable because the improvement of agriculture on some farms in the United States enabled American farmers to produce enough food to feed the United States and have a surplus for our allies during and after World War II.

Population is now increasing so fast in the United States that by 1975 the country will have difficulty in feeding itself unless more improved practices are put into effect.

The following is extracted from a report to the President by the President's Materials Policy Commission (June 1952, Paley report):

> The two great agricultural questions confronting the Commission are: Can the farm land of the United States provide the food and industrial raw materials needed in 1975? And, Is any major change likely in the relation of agriculture to the economy as a whole?
>
> The demand for farm products, including those required as raw materials by industry, is expected to rise steadily over the next 25 years. Within the Commission's basic assumptions, including a doubling of the gross national product by 1975, an increase of 40 percent in the demand for all products of the land except timber seems reasonable. This 40-percent figure is derived from estimates that a 1975 population of 193,000,000 (28 percent larger than that of 1950) will require production of 42 percent more food, on a constant-value basis, and production of 25 percent more nonfoods.
>
> The projected increase is necessarily conjectural. What happens will depend on the economic trends that actually evolve, on rates of technological development, and population growth, as well as on the even greater imponderables of domestic and international political developments. Nevertheless, the Commission believes that the estimate of a 40-percent increase in demands resting as it does upon detailed analysis of present and past evidence, affords the best available working hypothesis. Imports are not expected to take up an appreciable part of the required increase.

My great-great-grandfather settled along Green River in 1785 at the falls of Green River at the close of the Revolution, and then moved farther up. Now, then, you may ask why they settled there when it overflowed all the time. It didn't at that time—Green River didn't overflow from 1785 to 1835, 50 years later—until the forests had been cut off, and the land cleared and much of the land plowed and left bare; then the Rumsey bottoms did overflow. Now the overflow of the bottomland at Rumsey is expected each year. I don't know whether they had 25 inches of rainfall then or not. The average income per farm and per person in Kentucky was for many years much higher than in Tennessee. Kentucky had better land, a larger blue-grass area and much more coal. However, the income per person in recent years in Tennessee since the TVA has been in effect is much larger than in Kentucky. The proper development of the Green River Valley could have the same beneficial effect on Kentucky income.

The Department of Agriculture has made a very comprehensive survey of the Green River watershed of Kentucky and Tennessee as authorized and directed by section 3 of the Flood Control Act approved on August 28, 1937. This survey recommends a remedial watershed program to reduce surface runoff and erosion, stabilize the soil, and conserve water supplies in the Green River watershed during a 20-year period at an estimated cost of approximately $56,000,000 to the Federal Government and approximately $30,000,000 or its equivalent to local interests, making an estimated cost of approximately $86,000,000 for implementing the recommended program.

Measures to accomplish the objectives include construction of subwatershed waterways, terraces, and field diversions, gulley stabilization and sediment control, erosion control along roads and railroads, development of perennial vegetation, pastures, farm lands and wildlife areas, adequate fire control, forest planning, land acquisition, tributary channel improvement and stream-bank stabilization, and other soil and water practices and measures in accordance with the needs and capabilities of the land of the watershed.

Soil conservation and flood control as outlined in the Watts bill would coordinate fully with improved navigation and development of industry in the Green River Valley.

Senator CLEMENTS. I want to tell the out-of-State visitors and those who are not acquainted with him, that Wayland Rhoads is a native of this section, and the son of one of the great educators of our State, McHenry Rhoads; also that some 15 countries in Europe and the Middle East had the benefit of his knowledge of agriculture on assignment by our Government following World War II. For many years Wayland Rhoads was associated with the agricultural extension service in Kentucky.

After lunch, which will be served on the first floor, we will reconvene at 1:15.

(Whereupon, at 12:15 p. m., the subcommittee recessed to reconvene at 1:15 p. m. of the same day.)

AFTERNOON SESSION

(The subcommittee reconvened at 1:15 p. m., Senator Earle C. Clements presiding.)

Senator CLEMENTS. All of us have had the benefit of a very fine meal that was provided by the Green River Valley Citizens League, Inc., and their friends. I think it fitting that we give to those who provided this meal an expression of our appreciation.

It is my understanding that there are four groups to be heard from before we enter into the question-and-answer period. Their spokesmen understand that if they desire to abbreviate their statements the full statement will appear in the record.

Now I present Mr. K. J. Meyer, Jr., from the Green River Chair Co., Inc., of Livermore, Ky.

STATEMENT OF K. J. MEYER, JR., GREEN RIVER CHAIR CO.

Mr. MEYER. Senator Clements, Members of Congress, and friends of the Green River Valley area, the Green River Valley through its timber production in the past three-quarters of a century has played an important part in the development of our country. The cutting of trees throughout the valley was extensive. Industry in Evansville, Ind., bought prime logs by the millions to be manufactured into market lumber, ship timber, furniture, and other products. The majority of the timber was brought by raft down Green River to Evansville in the winter and spring and at no time during that season could you walk to the bank of the river and not see a raft approaching or departing. The logs at that time had a market value of from 75 cents to $1 per hundred feet. While millions of logs were being marketed many more millions were being destroyed in the fields in order

to clear the fertile farm lands of the valley. Because of this early indiscriminate cutting there is now a shortage of quality timber in this area.

Most of the saw timber produced in the Green River Valley is hardwood, such as oak, gum, beech, sycamore, birch, walnut, and poplar and many subspecies of these varieties. Red cedar is the leader in softwood timber. Small portable mills produce most of the lumber in the valley today. The majority of this is sold at local markets and is utilized mainly by furniture, veneer, and railroad tie companies in southern Indiana, Kentucky, and Tennessee.

There is a twofold purpose in the Green River Valley Citizens League's advocation of reforestation in the valley—one is that great quantities of water are absorbed by trees thus assisting in flood control; the other is the commercial value of timber. The President's Materials Policy Commission in its Resources for Freedom report, known also as the Paley report, gives the Nation's demand in 1950 for all types of saw timber at 40 billion board feet. This excludes logs for veneer, pulpwood, tie timber, etc. It is expected that this demand will increase to 44 billion feet by 1979. By 1975 the expected demand will exceed the growth by 40 percent, if conditions remain somewhat the same. Of this present-day demand two-fifths of all raw timber is produced from national forests, and the rest from privately owned forests and wood lots. The most alarming note in the industry is the present conditions by which timber is cut and handled and the lack of protection of our forest.

Though our national forests are well managed, many are as yet inaccessible and as a whole represent less than a fourth of our Nation's timber acreage. Industrial owned timber land is under fair to good management, but even then production from these holdings represents the smaller percentage of timber produced for market. Sixty percent of all timber cut for market today comes from land owned by farmers and nonindustrial holdings. This forest land is in most cases unmanaged and usually sold, giving the purchaser full cutting rights, which means that he can cut the saplings and bushes if he so desires. Along with poor logging management, blight, fire, and insects take their toll of standing timber.

These prevailing conditions can be corrected by practicing good timber and logging methods, avoiding denuding our timber land, and setting up protection against forest fires and insects. An educational program at local level handled similarly to our farm program, or along with our farm program, is needed to guide our landowners in the planting, care, and harvesting of timber. State laws are needed to control the cutting of timber according to the sustained-yield principle, and it has been found in some States that tax exemption on forest lands encourages reforestation and the interest in forest protection.

There is approximately 700,000 acres of land in the Green River Valley in need of reforestation. This would require the planting of approximately 1,000 trees per acre on badly worn or eroded land, and 500 trees per acre on land partly timbered. Recommendation for this needed reforestation is contained in the Watts bill now pending before Congress. The Green River Valley Citizens League solicits your support of this bill.

Senator CLEMENTS. I present Mr. Arch Moore from Morgantown on flood control-water storage.

STATEMENT OF W. A. MOORE, ATTORNEY, MORGANTOWN, BUTLER COUNTY, KY.

Mr. MOORE. Senator Clements, Members of Congress, ladies, and gentlemen. Senator Clements says that people who are to make statements to make them brief. That is what was said at the lunch hour, that you are supposed to file your statement in the record, say in about 5 minutes what you were to say in 10 minutes. That is a mighty big order for a country lawyer, especially since I see my circuit judge present, and he might get a notion in his head; however, I shall respect the suggestion made.

Since the dawn of civilization man has been confronted with the problems of the scarcity and oversupply of water. Primitive man was concerned with the needs for bare existence and, conversely, to avoid exposure to its destructive power when manifested in great volume. At times, we appear prone to consider water as an unnecessary substance that leaves wreck and ruin in its wake. At such times, we seem to take for granted the subsurface supply and as having little connection, if any, with the volume produced by terrestial rains, resulting in floods.

The children of Israel found their escape blocked by the sprawling expanse of water in front of them yet, in the arid section of their homeland we find them descending a long flight of man-made steps to reach the life-sustaining water of Jacob's well, from which the precious fluid was carried to their homes and stored and preserved to the ounce, for the preservation of life. Life-sustaining water may not exist 'mid oceans of it. Hear the Ancient Mariner who wailed "Water, water everywhere, nor any drop to drink."

Water covers approximately three-fourths of the earth's surface and most of it is too salty to drink. The oceans provide the reservoir from which water is constantly evaporating to fall back upon the earth free from substances that otherwise would render it unfit for use for many purposes. Nature provided the first and large-scale method of purification. It is absolutely necessary for the existence of the human body, which is about seven-tenths water. Man may maintain life for about 30 days without food, but no more than a week without water. It is as old as the earth and is one substance that is used again and again ad infinitum, by the process of evaporation into the air and condensing into clouds and water falling to the earth.

The heaviest rainfall in the world is at Mount Waisleale, Territory of Hawaii. There, the average rainfall is 489 inches in contrast to northern Chile where it is only 0.04 of an inch a year on the average.

Somewhere between the wide expanse of difference of rainfall of the above two points, comes every other locality in the world in varying degrees.

With the increase and anticipated continued increase in population of the world, coupled with the resulting complexities of civilization and accentuated by modern science, invention, and necessity of conserving world resources, economists have come to recognize water as an unending source of much that is required to sustain life, industry, and the well-being of mankind. Variable in supply, it becomes the concern of scientists and economists to attempt to bring about a more equal distribution of the needed substance conducive to the advancement and continuity of civilization.

In arid sections, storage and irrigation is indispensible to supply the basic needs of agriculture and human well being. In other areas, storage and flood control is necessary to nurture agriculture. In such regions power, navigation, and the potential of industry must be utilized if we are to meet the needs of an expanding population in the years to come. According to the Paley report, Resources for Freedom, 170 million acre-feet have been developed for storage and flood control in the United States. It further asserts:

> Not all of this storage space is available for conserving water withdrawal. Nearly one-fifth (19 percent) must be kept empty in readiness for intercepting floodwater and gradually releasing it so that downstream channels will not overflow and damage adjacent property.

Indicative of the thinking of economists and those in authority, is the fact that much study and expense has been devoted to our water resources by the President's Water Resources Policy Commission as evidenced by its report entitled "A Water Policy for the American People." The Paley report, referred to above, devotes considerable space to the various phases of water usage and control as related to the future economy of the country.

In line with the basic facts and data contained in the above reports, we come to specific consideration of the Green River watershed. It constitutes an area of 9,273 square miles, or 5,165,930 acres in which lies 31 Kentucky and 3 Tennessee counties in while or in part. It constitutes approximately 23 percent of the drainage area of Kentucky.

Four hundred thousand people, in round numbers, reside in the area. Agriculture accounts for the major portion of occupational activity in the basin. While coal mining is important in localized sections, the area remains virtually untapped in natural resources. This area comes in the category of these sections where flood control is of prime importance.

If the distribution of water in the area was exactly enough, but not too much, it would constitute a veritable utopia. Unfortunately, such balance is rarely existent, if at all, throughout the world. It is no small wonder that the area has attracted and should attract the attention of those realizing the vast potential of the watershed.

In March 1931 the Louisville district engineer completed a proposal for flood control of the Green River Valley. Among other things, it contemplated the building of dams in the upper reaches of the Green River and its tributaries. These are included in the Flood Control Act authorized by Congress in June of 1938 and have been awaiting appropriations which have not been forthcoming.

Realizing the stalemate reached in the development of the valley, those acquainted with the vast potential of it in all its phases joined together and organized the Green River Valley Citizens League on September 28, 1951, to compose and coordinate plans and efforts for the development of the area, including flood control. Compose and coordinate simply stated, means to put together and unify or harmonize efforts in a common purpose. This ambitious purpose encompasses the people of the entire valley. It is a self-governing body through its directors selected by the people of each area. Composed of 22 members, the board collected data, received and weighed suggestions, and held its first policy meeting at Livermore, Ky., on April 25, 1952. It invited the public to participate in the meeting which was well attended.

At this public meeting, with all the available facts, statistical data, and circumstances before it, a resolution was unanimously adopted. If there was opposition to it by any person present, it was not articulate. The resolution was as follows:

1. Whereas, the subject of flood control is currently uppermost in the minds of the inhabitants of the Green River Valley due to periodic high waters and the economic loss resulting therefrom which flood threat was recently emphasized by rains and floods of recent months; and

2. Whereas, the current flood situation in the Missouri River Valley appears to focus exclusive attention to that area and attention to the Green River Valley is shunted to the background thereby but which situation could well be duplicated to at least a minor extent in the Green River Valley; and

3. Whereas, the heavy rains of March 21–22 posed a pronounced flash-flood danger to Bowling Green on March 24 that could equal if not exceed the inundation in that area of the 1937 flood; and

4. Whereas, it is reported that the Mammoth Cave was adversely affected by said recent flood; and

5. Whereas, millions of dollars have been made available and spent in other river valleys for flood control while no appreciable amount has been available or spent in the Green River Valley; and

6. Whereas, in March of 1931 the Louisville District of Army Engineers completed one of the best proposals known for flood control in the Green River Valley but which plan has not been put into effect due to the fact that the highly controversial Mining City Dam was later injected into the picture thereby preventing any progress toward flood control in the valley; and

7. Whereas the Green River Valley Citizens League, Inc., was organized September 28, 1951, for the purpose of composing and coordinating plans and efforts for valley development, including flood control, on a basis to achieve the desired control or result in such a manner that would command the support of the citizens of the valley area and thereby present a unified front on matters of valley improvement and development including flood control; and

8. Whereas for other and sundry purposes: Now, therefore, be it

9. *Resolved by the board of directors of the Green River Valley Citizens League, Inc., in their third quarterly meeting at Livermore, Ky., April 25, 1952,* That:

(*a*) It is their opinion the four flood-control dams authorized by the Flood Control Act of June 28, 1938, variously reported for locations as follows, to wit:

(1) No. 2 on Green River above Mammoth Cave;

(2) On Nolin River about 9 miles above the mouth of that river.

(3) On Rough River 6 miles upstream from Falls of Rough; and

(4) On Barren River 10 miles northeast of Scottsville, should be built at the earliest possible date, and that

(*b*) The Watts bill known as the "on the land" water control and conservation advocated by the United States Department of Agriculture should be enacted and put into effect as soon as possible; and

(*c*) It is their further opinion that the action indicated above will have the desired effect of initiating much needed flood-control measures beneficially affecting the people of the valley and will bring about a spirit of cooperation and unity among the people of the valley so necessary to achieve the objectives of improvement and development for the valley as a whole.

10. The foregoing was adopted by the aforesaid board with the following board members present and which meeting was attended by a substantial number of public-spirited citizens of the valley.

River Channel Cleaning Emergency

Be it remembered, That in a meeting of the Green River Valley Citizens League, Inc., April 25, 1952, at Livermore, Ky., held jointly by the board of directors and members of said league and interested citizens of the Green River Valley, this resolution was unanimously adopted:

"Whereas the floods of the past winter and spring floated and deposited logs, trees, snags, and other debris into the channels of Green and Barren Rivers; and

"Whereas the said floods prevailed in most of the Green River Valley constantly from November 2, 1951, until date, causing the banks of said rivers at several places to be undermined, unstable, and to slip into the channels of said streams; and

"Whereas the said streams have been filling up for the past several years (due to lack of funds for maintenance and upkeep); and

"Whereas safe and practical navigation of said streams is now threatened unless immediate steps are taken to remedy and relieve the congestion and obstruction of the said channels; and

"Whereas unless money is made available to the Louisville district engineer for the purpose of channel maintenance of Green and Barren Rivers, heavy loss will be suffered; and further

"Whereas the usefulness of said streams as the main arteries for normal drainage and for carrying off flood waters, is becoming impaired; and

"Whereas the aforesaid river beds are fast filling up and becoming useless for the normal drainage of the rich and fertile farm lands of the Green River Valley: Be it therefore

"*Resolved*, That this deplorable condition be called to the attention of the said Louisville district engineer, the Chief of the United States Corps of the Army Engineers at Washington, the Kentucky Members of the United States Congress, and the Vice President of the United States, for the purpose of urging and requesting immediate action to have cleaned out logs, snags, trees, debris, and other channel obstructions in the interest of improved drainage, flood control, and safe navigation, thereby preventing premature floodings and poor drainage of farm lands as well as hazardous river transportation; be it further

"*Resolved*, That said authorities be implored to recognize the condition created by said floods is emergency in character, requiring immediate action to prevent great and irreparable loss; be it finally

"*Resolved*, That this resolution affects in no manner the much-needed modernized navigation and flood-control measures which have been under consideration for some time past.

The four dams are named in the 1938 Flood Control Act. We are indebted to the United States Army Corps of Engineers and the division of flood control and water usage, department of conservation, Frankfort, Ky., for the statistical data following, to wit:

No. 2 reservoir on upper Green River, upstream from Mumfordville would have a flood control storage of 252,000 acre-feet;

The Nolin Reservoir, 9 miles upstream from its mouth, would have a storage capacity of 464,000 acre-feet for flood control;

No. 2 Barren Reservoir, located 10 miles northeast of Scottsville on Barren River would have a flood control storage capacity of 478,000 acre-feet; and

The Rough River Reservoir, 6 miles upstream from Falls of Rough on Rough River would have a storage capacity of 300,700 acre-feet.

The flood control capacity of all four aggregating 1,495,700 acre-feet. This means the equivalent of 1,495,700 acres covered 1 foot in water. The dams creating these reservoirs would be dry dams, but never completely devoid of water, according to the league. During the flood season, they would be emptied when danger of a flood passed preparatory to filling and containing the water on imminent threat of another flood. It does not take an engineer to conclude that these dams would materially benefit low-land farmers throughout the valley. But artificial impoundments of water is not the only approach to water storage so essential to flood control. In the same resolution, the league also endorsed the Watts bill, which is the United States Department of Agriculture soil conservation proposal for the entire valley, one phase of which is "on the land water control." That this plan, supplementing artificial impoundments, would be highly effec-

tive cannot be denied in face of the facts and figures. Colonel Rhoads has covered that feature superbly.

At present, the average annual rainfall in the valley is 46.5 inches. The average annual runoff of water, that is, the water that reaches the streams, is from 17 to 20 inches. What becomes of the remainder of 26.5 inches to 29.5 of the annual rainfall? It is absorbed by the earth much as by a sponge and which water constitutes and maintains the moisture level in the soil to support crops, pastures, woodland and water supply for man and beast. Artificial impoundments on the farm in the way of ponds and streamlet dams are yet an insignificant contribution to the containment of water though offering material promise under soil and water conservation proposed in the Watts bill.

By improper land use we have reduced certain types of weed land to cultivation that should have never been cleared and now contributes nothing to our economy. We have permitted other cleared lands to become eroded that hastens the water to the streams. We have reduced a vast acreage to the state of submarginal land and almost rendered it devoid of humus or soil bacteria which permits surface water to soak into the subsurface and maintain a proper moisture level. In the process we have given impetus to the flow of water to the streams that falls on the land when the subsoil needs it and would conserve it for agricultural purposes.

How much of the 17 to 20 inches of annual runoff of the average rainfall can be stored in the earth and underground streamlets for reforestation, terracing, soil and slope seeding in grasses, and on the farm needed pond impoundments? The answer is found in the facts. The valley suffered the record flood in 1937. Contemporary with the ever-expanding improper land use, the floods have risen, step by step, higher and higher in the same proportion of the enlarging abuse of the land. We have reached existent conditions from a state of substantially few destructive floods a century ago: at least there is an absence of records of such floods before the World War.

Of great importance to the valley is the necessity for industrial development which is wholly impossible without a very substantial and continuous supply of water. Presently we have in flood seasons an oversupply only to be followed by periods of shortage. Here is where the reservoirs become wonderful. In this connection my folder of exhibits contain excerpts from the Paley report and a league release of August 8, 1952.

Thus, it is reasonable to assume that combined with planned farm management embodying soil and water conservation for crops and other uses, the valley will be relieved of many of the frequent flood threats so destructive to the people of the area. Of course, nothing will completely eliminate floods. By such management, we can expect that conditions will be restored to a marked degree that existed 75 or 100 years ago. Add to this, the water to be contained in the four impoundments already described, and, in my humble opinion, we will have found a solution to the frequent and continual flood threat to which agriculture is constantly exposed from its source to the mouth of Green River; that is the plan of the Green River Valley Citizens League.

Present conditions are not conducive for immediate relief, but the hour we arrive at our destination is controlled by the time we embark

on the undertaking. For 20 years lethargy has prevailed and nothing has been done to actually relieve the situation. An aroused and militant citizenry, united and pulling together, is attracting the attention of those in authority to the extent that the wheels will begin to turn. That is one of the functions of the Green River Valley Citizens League, an organization composed of members up and down the valley who are interested and anxious to encourage a plan that will benefit all the people of the valley.

The motto of the great Commonwealth of Kentucky best epitomizes our position: "United we stand, divided we fall." With these remarks, I file my statement with the exhibits. I thank you.

Senator CLEMENTS. I now present Col. Oren Coin, drainage chairman of the Green River Valley Citizens League, Inc., who will speak on drainage and channel maintenance.

STATEMENT OF COL. OREN COIN, GREEN RIVER VALLEY CITIZENS LEAGUE

Colonel COIN. Senator Clements, distinguished guests, ladies, and gentlemen, I submitted my paper for Mr. Reed to edit, and so forth, and he did quite a bit of editing at the time, and then they come around and said cut it out altogether.

Mr. CLEMENTS. Don't do that; continue with your full statement.

Colonel COIN. I had better not go against the Senator's wishes. I will put the last page on top. I want to ask these engineers a question—if they have heard of such a thing as water seeking its own level, and if they are ready to stand up and defend that? Then I can show you a place where you can pour water in a pile and walk off, and any time you please find that water still piled there in the middle of the ridge where I live at Livermore, Ky., near Island. That is a fact, and if you don't believe it is a fact, come to our home on January 1 next year and wade it and you will see it. [Laughter.]

Green River, the deepest river in the whole world. How the argument raged in the years past. We readily admitted that this was true, but just where was it the deepest. Some said below Rumsey, or was it of the greatest depth above there? Some said that 1 mile downstream from the railroad bridge at Livermore, but others held out for a point near Smallhouse, and so on into the night. The unrivaled beauty of the stream was there for all to see. The uninterrupted sheen of its green was enrapturing to all who viewed it. But low is the mighty fallen.

Some three-quarters of a century ago our Government began throwing dams across the river channel to aid navigation. They may also have sought to restrict to some extent the buccaneers, known as raftsmen only in the politest of society, who gave ground to no one. To those who had to deal with them they were scum from the sloughs of hell. Woe to the unwary men that ventured in sight of these fellows on the river, or the cow with the promising udder that came to drink. Why pay for such subsistence when nimbleness and cajolery would suffice. Then, in event of failure there was always the rails to be had for the lifting that made top kindling wood when aboard. It was not all fun for these worthies, for at times the current tied them to the end of the bar of some 40 feet or more for hours on end. But if working astern, one could always throw the raft into the competitors' house-

boats, raise boats or ferries, and force them fast aground or break them loose altogether. A certain craft must be exercised here, for, even though it was the deep of night, these fleets only made a mile or so per hour, and there was always the possibility that the aggrieved one might overtake the raft. Even an ironclad alibi did not always work, but there was the water and the opposite bank for refuge.

After these dams were constructed the Corps of Engineers kept at the snag pulling, cutting of leaners and every sort of channel clearance. In addition, they had hard-boiled agents plying the river that were the scourge of the rivermen and those on shore that were inclined to carry on so as to hinder navigation or cause any sort of stream pollution. A Yankee came to our town to operate a mill. He dumped refuse too near Rough River. The sawdust floated out into the current, and Captain Rose tracked it to its source. Immediately he delivered his ultimatum, "Move the whole condemned mess or else." His cries of anguish availed him not. Since there was time limit on the clearance, the price of labor went from 10 cents per hour to 15 and 20 in no time. Twenty if you could stay with the mire and cold water to handle slabs and dust. To only be able to shove the wheelbarrow up hill loaded put you in the lower bracket. There was no question of hours; in fact, he would not let you stop work.

The engineers could do nothing about the sudden freshets or the turbulence caused by the frequent passage of the towboats and packets. The raftsmen hollered that the boats used their power to increase their (raftmen's) perils. Whatever the facts, the logs broke from their moorings or the rivermen lost control of them and they piled against the dams, the bridges, piers, and the river banks in the bends and broke up. Often the better stuff freed of their floats went to the bottom. The deep hole at Livermore below the railroad bridge became the graveyard of many a timberman's profits and hopes. Branded logs found no buyers and so there was no incentive for the timber pirates to raise them. These sinkers added to retardation of flow and became moorings for underwater drift and silt. And so our best timber is buried without reverence and in degradation.

Our Government pulled out and our dams began to show their true colors and be really dams in every sense of the word. When the dredging stopped, the foreign matter was carried to them and there it sunk to stay. Every particle of silt so trapped lessened the capacity of the channel and increased the slowing of the flow. This condition was soon felt by the feeder streams loaded with our farms and racing to the Gulf of Mexico. The incoming flood was retarded by the sluggishness of our river and lost much of its load in and in front of its mouth to become a double menace. Thus, when we are kicked in the pants on one hand and turned to see who or what delivered the greetings, we are slugged just over the ear by an enemy of our own making.

The dams that were so wonderful as to construction and utility in the eighties lost their glamour and worth for us. While the engineers were with us, we damned them for their efficiousness and interference. When they expeditiously folded their tents and so silently stole away, our chickens really came home to roost. The pollutionist and nature showed their true colors. The short line timber flourished, grew heavy of top and limb. United with the water, it played havoc with

our channels in the most destructive way. Great yardage of earth came with the tree moorings as they slipped into the stream from source to mouth. The water that had promoted the growth now carried death to the half submerged timber so that the channel is now a crazy patchwork of islands of dead and dying wood and drift. These stark pointing fingers jutting from the water are fitting monuments to our shortsightedness and actual stupidity. Time has, of course, taken its toll of the dams. Obsolescense did not stop decay until now most of them are just one jump ahead of being debris. Some are leaking until they fail utterly in the task for which they were intended, needful or not.

Navigation, with the outmoded lockpit with slipping wall between placed with all the strategic ability of the harmed one, who would speak of it. A self-respecting moccasin would have no part with it. Perhaps, the thing that should be looked into is the mind of these pilots and boatmen who venture out on the stinking, shrinking bosom of our stream. How they can hope to thread their way through this maze is well beyond the normal thinking. The timber is gone, the engineers are gone, the packets and towboats are gone, and who would wonder. Left is ourselves, our elder selves if you please, our asphalt, our coal, and our utter debasement. But we ramble on about these side issues and say nothing of the thing that we have been most successful with. The river, may I remind you, was left here to carry away excessive rainfall. That, we have stopped to an astounding degree. The filling at the bottom of the channel, the numerous slides, and the enormous deposits of waste and silt that we have contrived to keep with us has cut the value of the flowage and capacity to an alarming extent. We have completely baffled the engineers. Water seeks its own level. Who is willing to stand and defend that one. Our basin is the only place in the earth that you can pile water, go nonchalantly away, knowing that it will be there when you return. This leads to the phenomenon of floods in our land when the receiving streams are not even exerting themselves as to capacity. Then, if the Ohio does have a rise, the water recedes, but ours stays on for an embarassing length of time. This is not because we like backwater or that the water with us is not just water and might even react normally if it could. But the many restrictions are just too much and so it is around after the adjacent areas have forgotten the whole thing. This is badly put as well as impossible, but you just come into our basin on January 1, next year, and wait and you will see with your own eyes what I mean.

In our lowlands, the clang of the clamshells and the shovels are never stilled. Miles and miles of waterways and ditches have been constructed. The straight and open runs carry the rainfall to the river and its tributaries in a minimum of time. No more are there big pools of water left after the spring rains in our lowlands. No more will the growing boy know the ecstasy of joy of finding one of these pools drying up in August with its grounding of the luckless bullheads, nor the plumbing of the depths of despair upon being thrown from the lean-to along with said oderous cat food by his unappreciative mother when he breaches the subject of the preparation of his stores for human consumption. But we are running into another menace and that is the lowering of our water table all about us. The springs of our youth whose location was known to the raftsmen plying the nearby rivers

He left his run above them accompanied by a jug of water. It matters not that his route of return led him through your corn just as it was in good form for eating as is, whereis, boiled, fried or for fish bait, he really was wanting potent water. In many instances, the springs are gone. The water of our wells is either nonexistent, much lower than it formerly stood causing us to go much deeper than we ever had to go yesteryear to obtain our supply. This condition may not have been caused or aggravated by this quick disposal of our water before it has time to soak into the earth. It could have been a contributing factor in the severity of our drought this summer.

The league should start another project with the aid of our conservation and soil management people without delay. That is the retention of some of this water with us for our own use. We should not wait for the Congress to pass laws to do this. We will, of course, have to have that aid before we accomplish a complete eradication of the known evils upon us, but again we should not ask for this unless we put a shoulder to the wheel. In this age when farmers pay out large sums for fertilizer for only an acre or so of crop, he cannot afford a loan on the whim of nature for moisture. Could he not go into the higher reaches of the land and find a corridor or drain, throw a fill across it and impound a lot of water. Almost every farm has a compartment of this nature. If he is able to have a dozer come on and do this, well and good. If not, then we should present him with a plan with the aid of the above-mentioned authorities whereby he can do it himself. Inveigle a neighbor into going in with him on a blade that will work on his own equipment. He then can work on his fill when his wife gets too insistent about the repair of the chicken fence that he fully meant to wind up early last winter. If located on higher, less productive land, he might let the law of gravity in for some use. This should cushion some of the jolt that he and his immediate family are sure to get when he asks the price of pumps and pipe. But just think if it could be worked, he could have an inch of water on his tobacco weekly, rain or no. In North Carolina this year, the dry weather came and they tried this on a pasture and it seemed to work. Whereas the adjoining fields were seared, this field was green and supporting two cows per acre and still there was grass. I don't know the particulars.

I know that you have been thinking of this for years and that you have long since added irrigation to that overworked plan of using ponds for stock water and the production of edible bream. I know that you have seen too many embankments carried away in a sudden downpour or your most unproductive saw timber went through same and siphoned off the stock of fish as the water went where the woodbine twineth not. That the cost is out of your and everyone else's reach. And besides irrigation does not work anyway. Then who is there in or out of the league that can set us right on this? No one, perhaps, no that won't do, for we have the really good men in this line in our State. Men who can tell us whether to plunge or forget the whole thing. Who can tell us where to economize and where not to try a short cut? The fact remains that it seems worth an assist from us. You have worked for years and sunk much good hard money on a few acres to bring them to a desirable production plane. This, just another step, may be the one that will insure the harvesting a crop of

top quality and quantity every year. Then a dry year need no longer scare you to death. The solemn fact is, if we are to ask our Government to expend great sums of money in our valley, we should get busy with any means at hand that might improve our lot.

In spite of all the squawks to let out concerning our roads, the State has brought us a pretty good system of roads. This is true all the way to our feeders. The value and condition of these roads is lowered every year by inundation. Much of this trouble comes to us because of poor drainage. Only last winter one of my relatives went over east of Island coon hunting. He heard a rumor that the ridge was crawling with the ringtails. They left the pick-up and went in dry shod. A few hours later, upon trying to return, they found themselves hemmed in. Water everywhere, blotting out trails and taking all the joy out of this noble sport. After driving every mongrel in the neighborhood to let out an unearthly din, in answer to their plaintive cries, they brought a local resident to his door fully determined to defend his family to death from the Stalinites. He was thankful enough, when he found the cause of the rhubarb, to point out the trail to them and they came across, each encumbered by a tree dog. What a night. This must be stopped. Incidentally, they did nothing to change the count of the wild game in the area.

Scores of cars loaded with workers that leave our place every day to work in Owensboro and other places are forced to drive far afield on low-type and dangerous roads because of the headwater across State Highway No. 75, near Petit. Several times a year this occurs. The same is true of State Road No. 136, both east and west of Livermore, though it is generally water from our river that cuts us off from the county seat, Calhoun and from Ohio County, on the east. Headwaters storm across United States Highway No. 62, in the Caney Creek and Horse Branch areas frequently.

State Highway No. 81 goes under water at the least provocation. This could go on for all time. The point is that this dislocation of travel and trade could be avoided or the time of inundation vastly shortened, if we could boast of a clear channel to the Ohio River. Our highway department patrols the dangerous areas, maintains all-night vigils to drag out those who do not believe in signs. When the water finally recedes, out come the repair gangs for days and weeks to put the roads back into a passable condition. Still they are not as good as they were before the floods came. Thus goes our road money to no avail.

In our vicinity, there are two unusual troublemakers in the form of creeks that flow parallel to and near larger streams for considerable distances. This condition causes them to have very little fall over long distances. The worst offender is Panther Creek, which makes its way into the Ohio River Basin but fails to go the whole way. It meanders about the landscape always with its shroud of willows and finally trickles into Green River after a dilatory fashion. As a drainage factor, it is a failure, or nearly so. We must ask the engineers to improve this if possible and they seem to feel that it is possible. The same goes for Cypress Creek and Green River.

Mud River is a small stream that has a great area to drain. It enters the Green just above the dam at Rochester. It could be carried into the river below the dam with a minimum of effort. Already in times of flood, much of its discharge goes over this route. As it is, it

must strive with the impounded water of the river for relief. At Woodbury, the course of Little Muddy could be changed and its waters carried into Green River rather than Barren. This will require engineering but it would be a great improvement, if feasible. All of the streams mentioned are slow in getting rid of their water in the spring, thus retarding planting. In the fall, the danger of a rise is always with those that farm the adjacent lands. And so the fight goes on to get the crop out, get it matured and harvested, before the rains reduce the fields to bogs. There is a remedy for this and we must find it. There are numerous problems of this nature awaiting a solution throughout the valley, including Long Fall Creek at Calhoun.

We need channel clearance, new dams, cooperation, and coordination throughout this valley. We need to keep some of our excess water for our own use. We need to get water off and away from our cropland, factories, and homes. If we get all this, we must keep a cool head, a giving and a forgiving nature, a lot of luck and the help of God. Any question?

I want you to meet Mr. Virgil Stewart and Conrad T. Young of Beaver Dam, Ky.

They have run this river and can tell you first hand of the conditions over the greater part of its length.

Also listen to Capt. Omar Hines, who is now plying Green and Barren Rivers weekly.

My folder of exhibits is herewith filed for consideration.

Senator CLEMENTS. Now I present Capt. Omar Hines.

STATEMENT OF CAPT. J. O. HINES, RIVER PILOT, BOWLING GREEN, KY.

Mr. HINES. My name is J. O. Hines, Sugar Grove and Bowling Green. I began my river career in 1916 and at the present time I am navigating Green River valley and have also operated on Ohio, Mississippi, Cumberland, Allegheny, Monongahela, and Kentucky Rivers.

My experience on the Ohio River was before the present modernization program was in existence. At that time Green River was often mentioned as the deepest river in the world for its size. The river is filling up to such an extent that at the present time barges loaded to the minimum depth of 5½ feet drag the bottom in many places from the mouth of Green River to Bowling Green on the Barren River. The physical condition of the river has also changed due to no fault of the United States Engineers, because they have not had equipment and appropriations to properly maintain the river. The river is rapidly filling up with silt and bank slides. In the year 1912 the United States Engineers snag boat, the Steamer *Mammoth Cave* pulled 774 snags from Green River. Literally hundreds of trees have slipped into the river during the last few years, and if a modern plant were available to remove the trees and snags, it would require the engineers many months to remove them from the channel. Only temporary or emergency dredging and snagging have been done in the past few years. It is quite a problem now to navigate a 480-foot tow, due to the points of the bends being filled with silt and quite a few bends and points having slip-ins which necessitate considerable time in switching to pass these places.

The fault lies not with engineers or Congressmen or any other Government agency, but with the citizens of the valley for failing to realize the economic potency of a modern navigable river. The river as it is now, makes operations both hazardous and uneconomical. The people of the Green River Valley now fully realize the need of the improvement to our rivers in conjunction with the over-all program for the valley. It will be shown by others appearing before this committee that the cost will be justified.

We, therefore, urge Congress to change the physical aspects of Green and Barren Rivers from the present deplorable condition to a modern avenue of thriving industry, trade, and commerce.

Senator CLEMENTS. Thank you, Colonel Coin, and all those associated with you in expressing your viewpoint. And I want to tell you, Colonel Coin, as a member of the American Order of Coon Hunters, I want you to know I appreciate that plug you put in to make for better hunting. I thought you were going to testify about some that may be in cold storage today and I wanted that in private, since there was one Federal game warden in the group and maybe there might be one State game warden around.

I now present Capt. Thomas C. Melton, a river pilot of Morgantown and Smiths Grove, Ky., who will speak on modernized navigation.

STATEMENT OF CAPT. THOMAS C. MELTON, RIVER PILOT, MORGANTOWN, KY.

Mr. MELTON. Senator Clements, ladies, and gentlemen, I thought I was going to get out of this since we were short of time.

My name is Thomas C. Melton of Morgantown and Smiths Grove, Ky. I have been a licensed river pilot for 9 years still in good standing and have operated on the Mississippi, Ohio, Tennessee, Cumberland, Green, Barren, Nolin, Allegheny, Monongahela, and Kentucky Rivers.

Five of the six locks on Green River were built in the 1800's and were of sufficient size for that century, approximately 35 x 135 feet. The packets were the only boats in popular use and carried the passengers and freight together on one hull. The process of locking tows on Green River is very slow and it is necessary to pull each unit through the lock by hand. The valves and the wickets that control the water level in the locks are also hand-operated. Standard Ohio River barges cannot pass through these locks even one at the time. It is necessary to transfer any commodity from Ohio and Mississippi River barges to small barges which makes the movement of cargo in or out of the Green River Valley by river uneconomical.

Compare these small locks with the Ohio River locks of 600 feet. Compare the limitations of our 5½-foot channel in depth with the 9-foot channel in the Ohio and many other rivers. We hear that future plans call for a minimum of 12 feet on both the Ohio and Illinois.

Lock No. 5 on Green and lock No. 1 on Barren were rebuilt in 1933 to the size of 360 x 56 feet and are power-operated, except there are no haulage engines for double locking. The other locks on Green River should be modernized in keeping with those on the Ohio River

so as to avoid costly transfer of cargo. The ideal tow in Pools 1 and 2 of Green River would be six Ohio River barges 2 wide and three long, thus requiring standard Ohio River locks 600 x 110 feet.

We ask for a minimum channel of 9 feet throughout the Green and Barren Rivers so designed that 12 feet can be instantly had when needed.

Let us compare the modern fast movement of tows on Ohio River and other improved waterways being pushed by powerful screw wheel boats, with the slow sternwheel, shallow-draft boats used on those same rivers before they were modernized. Be it remembered these shallow-draft boats are the type used now in the Green River Valley. Modern towboats cannot operate in our valley.

A single tow on the Ohio River is moving 200,000 barrels of petroleum regularly. A normal Green River tow is 12,000 barrels.

I hereby file a folder of exhibits pertinent to my presentation.

Modern navigation is absolutely essential to industrialization of the Green River Valley.

Mr. CLEMENTS. Next we will hear from Mr. C. A. Reis, owner of Green River Mine and Possum Hollow Coal Properties, South Carrollton, Ky., who is the honorary president of Green River Valley Citizens League, Inc. He is a busy man, and has his heart and soul in this work, Mr. C. A. Reis will speak on the economic aspects of the over-all Green River Valley development program.

STATEMENT OF C. A. REIS, COAL MINE PROPERTIES, SOUTH CARROLLTON, KY.

Mr. REIS. Senator Clements, guests, ladies, and gentlemen, if the United States Department of Agriculture's conservation program were started this afternoon, it would be late—not too late, but it would be late. Someone, somewhere back in the forties, got the Green River watershed program given preference, I don't know his name, maybe Congressman Clements at the time, whoever it is, he is going to be found out, and we are going to find out and see that he is properly rewarded with the proper public recognition.

Next, on the economic aspects of flood control, I would like to file a folder of exhibits, along Green River, particularly at Livermore, Ky., showing flood scenes along Green River. How would you like to be driven out of your warehouse as much as once a year, or your factory, and sometimes there are times when they have been driven out two or three times a year. I say it is a sin and a shame we have let those people suffer the consequences there. I often wonder how those two factories, the Green River Chair Co. and the Livermore Chair Co., have conducted their businesses all these years in the face of those difficulties. Only because of the superlative management of the Meyer and Render factories. Colonel Strong is going to give us four dams in the upper regions which will help immeasurably. If that don't help, I think the league will consider the recommendation of a flood wall at Livermore as Evansville, Louisville, and Tell City have.

On the subject of water storage, if the 1931 program as written up by our old friend Col. W. A. Johnson, and we had helped him carry it out with those six or seven flood-control and water-storage reservoirs in the far upper reaches, the steam plant at Johnsonville, Tenn., would

have been built in the Green River Valley, for the simple reason that it costs money to haul coal over there. Here with the upper dams we would have water right along with our coal. Have any of you thought of that?

In connection with the subject discussed by my good friend, Colonel Coin, Drainage Aspects and Channel Maintenance, I want to leave this thought. If the economic aspects are the greatest in this, it might be given serious thought to the high availability of the soil that must be washed or dredged out, could it in some manner be stacked on the bank to be hauled away by enterprising farmers? I think I have got a garden that would like to have some of that stuff; it would be like so much gold.

What about all those saw logs Colonel Coin talked about? They have a lot of them standing straight up in the river today that are worth a lot of money.

Now as to the economic aspects of coal reserves of Green River Valley. At one time it was my opinion that our coal reserves are our greatest resource, but as previously stated this is not so because soil and water take precedence for obvious reasons. I will say that here are the sinews for upholding the dignity of man. There is nothing even nearly approaching the coal reserves of the Green River Valley anywhere. Without reserves there would be no atomic power. Atomic power simply stated means gaseous diffusion or disintegration. It takes an unlimited amount of power to do that, and the only reliable power and the cheapest power is from coal provided by plants, steam- and electric-generated plants where coal and water meet. We have that here. No place in the whole wide world can equal or compare with us in our resources.

The next subject; I want to file a brief on the subject of coal reserves in March 1950.

It is important that we discuss the requirements for river-transported coal by the Tennessee Valley Authority, Atomic Energy Commission, Electric Energy, Inc., and Ohio Power Co.

I want to say to our good friend, Colonel Strong, that by the end of this fiscal year, it is going to be too late in providing us with modern transportation. I have spent 45 years in transportation and coal. Dull as I am, I know that we are heading for trouble if we do not prepare immediately to haul this coal needed by these plants; I mean starting right now. There is a demand of at least 30 million tons a year built up, that must be supplied in addition to what has been previously supplied, and the bulk of that coal must come from the southern Indiana, southern Illinois, and the western coal fields of Kentucky; and if you get it at the cheapest place you will get it right down here, providing Colonel Strong starts those concrete mixers tomorrow morning, and I am not kidding.

Now, you say, well Reis you are getting too big for your britches. I have been studying these things and I have in my grip here communications requesting bids on coal amounting to over 7,000,000 tons per year, and that isn't hay. That isn't either the TVA, and it isn't AEC. Now what are you going to do to move that coal? First you have to improve your river, and then you have to build some barges. One hundred and forty tons of steel will build a barge to move approximately 1,000 tons of coal, whereas the same amount of steel will

build only six railroad cars, and would haul approximately 330 tons of coal. Now the railroads tell us, and I am a former railroad man, I got my education with them, my good friends out there, we will turn our cars quicker than your barges. Don't believe that. Now they operate barges at night, and during fogs. Some have radar. We will show that they have a better record turning these barges around than the railroads do turning their cars around.

Some of you oldtimers out there, like Paul Wickliffe, remember the private railroad cars, where they would take a bunch out and put them down on the Johnsonville, Tenn., plant, and run them back and forth. If you do that somebody else is going to do without coal. I have no quarrel with the railroads, but I know they have been hitting us under the belt. Why should coal move by river? You are all stockholders in the greatest corporation on the face of the earth. I mean real stockholders when you pay taxes, and you are apparently interested in this thing, if you wasn't you wouldn't be here today to listen to this dry discussion of economics. But to illustrate quickly as to what you could save. I know of one contract in western Kentucky, Green River Valley, if you please, for 5,000,000 tons of coal, probably Johnsonville, it doesn't matter. If the river isn't opened up by the time that stuff is going to move, freight rate on it is going to be $1.50 to Johnsonville. If the river is opened up, Colonel Strong, we are going to save Uncle Samuel 52 cents a ton, and that isn't hay. We could go on first to Paducah, and save on freight by stream to Joppa. You save $1 on the transportation, another $1 on the cost of coal at the mine, in competition with Indiana, Illinois, and east Kentucky coal. I know what I am talking about, gentlemen, I have confidence in people who know that is something that is worth saving.

Senator, I am sorry to take so long, I get worked up about this thing.

Senator CLEMENTS. Go right ahead.

Mr. REIS. If this river is opened up, there is no question in my mind that within a very comparatively short time after completion of the work, you will have at least 3,000,000, and most probably 7,000,000 tons of coal a year run out of here. In Colonel Bidgood's statement he has been worrying whether they would get the gold on the barrelhead. Colonel, I think it would be a very short time if you save 50 cents a ton on 6,000,000 tons. I think that it would be quite interesting if we get on that Madison deal, no telling what we could save. My good friend, Burt Moore, knows what I am saying is the truth, and if we had the time he would get up here and corroborate it.

Let's forget Mining City, that is what the league said, what Judge Moore said in my language, let's get something done. If you do that there is no question as to industrialization, absolutely none. I want to read a brief line: "within 2 or 3 years Carbide & Carbon Chemicals Co. expects to make investments in full-scale plants of from $100 million to $400 million." Senator Clements, I hope some day soon that you will be able to assure us that we are going to get those greatly needed water-storage tanks in navigation. When you do, I think I can assure the valley that we are going to get one of those plants here for the simple reason that coal and water together—you can't beat it. We can say the same about steam-electric and carbide plants that require huge amounts of water power and coal. This is the best place on earth for it, we don't know it for sure, but I believe that I can prove it. I will debate the thing anywhere in the United

States or in the world. I am not a bit afraid I will not come out on top, and I don't think I am exaggerating.

I just want to ask this question. If in 1931 the Johnson plan had been carried out, and we had obtained two storage dams in the upper reaches and navigation, don't you think that this place here would have at least as good a footing as the area around Gilbertsville? Why don't you people get in this thing and help us put it over? Why do you folks oppose us? I would like to have the management answer that

The railroad people were invited down here. I don't know if any of them have come. We did debate the problem before the Kentucky Chamber of Commerce last November.

Senator CLEMENTS. Mr. Metcalf is here, and he says he will take the question back to the management.

Mr. REIS. If we opened up the river, as we want to, there is no reason why there should not be a tremendous flow of coal to the river, not only for barges but mostly for industrial concerns. It will move in trainload lots, and if you get this large tonnage, I will say to you we can make money at 25 cents a ton in trainload lots. If you don't do it you will have rubber railroads running across this country as surely as I am standing here.

And now the economic aspect as to payment for the program.

What strikes me about the whole thing is we have the United States Department of Agriculture conservation program—the Watts-Underwood bill. Under that our good farmer friends pay part of their bill. There is nothing wrong with it. I think it is a good idea. When we come down here and navigate, use power for water and industrial purpose, we get it for nothing. The Mississippi Valley Association will probably have me hung at sunrise, but I am recommending that the Government require the coal operators to pay something on this navigation business, also on the industrial water supply because they simply can afford to pay it. These things should be amortized. Above all we must first have sound money, and that is one way of getting it. Why should the farmers pay and these other fellows not? I know only too well that the Ashland Oil & Refining Co. could easily pay every time their products went down the river on every ton of petroleum products they haul. You could start at Green River or any other place. I say that it ought to have some consideration, and if you give it consideration I believe you will have the league in back of it, whether the Mississippi Valley Association likes it or not.

Senator, I have a very real picture right up here, that approximately in my mind's eye I can see Quarterback Clements has caught a long pass from Washington to Green River Valley. In my mind's eye I can see it flow majestically here, and this time we have a team in the field, and I can see our man on the 10-yard line, well protected, and it looks like he is going to get it, and, if he does, I believe we can set up an end-run play.

(Mr. Reis' statement in full is as follows:)

I did not think applause was in order at a congressional hearing. However, we are in Kentucky and have a Kentuckian for chairman, which makes all the difference in the world. Assuming the applause to be in the nature of approval, I humbly accept same on behalf of the real workers and leaders of the Green River Valley Citizens League, Inc. For 32 years I have been willing, but unable until this group from throughout the valley came upon the scene starting late in 1948. In my book it is the very best and most efficient civic group that has ever functioned. Although time is limited, it is important that recognition be

paid to these men for the good reason that we have not lost the interest and efforts of a single worker in face of the fact that the league has met with almost untold difficulties. In meeting same it is true that Mayor Harding and I resorted to some of "Bull" Halsey's tactics, viz: "The war will be over in 4 months." Some of the difficulties I will outline because it is important as background information.

To begin with, we will always be more than thankful to Paul Wickliffe, of Greenville, for his success in having the late Senator Chapman prevail upon the Senate Public Works Committee in April 1949 to resolve in favor of bringing up to date the so-called existing project navigation survey and report. This was followed by the public hearing at Henderson, Ky., October 12, 1949, before the then Louisville district engineer, Col. John L. Person. At that hearing we seemingly won the debate but lost the case. Shortly thereafter Colonel Person, who had accumulated a vast personal knowledge concerning the navigation aspects, was called away to war, and then the task had to be faced of trying to inform his successor, Colonel Bidgood, which is no small task when you consider the enormous and widespread duties of a district engineer at a post like Louisville.

In any event, we had dreams that the concrete mixers would be grinding early in the summer of 1950 and so stated to Colonel Bidgood, but in this we were sadly disappointed, even though we presented a huge amount of supporting data to the Louisville district engineer. Suddenly Senator Virgil Chapman met violent death and it was freely predicted that the Green River project died on the streets of Washington. To make matters worse, in midsummer of 1951 the Louisville district engineer exhausted funds for completing the survey and the Kansas flood wiped away the crew he had working on the project. This was not discovered by the league workers until August 30, 1951, whereupon the late Congressman Whitaker sought to have emergency funds provided, and while he insisted that this was being done the funds never reached the Louisville office. Senator Underwood assured us on October 30, 1951 funds had been arranged, but these too failed to show up which made the third time that same had been provided. Congressman Whitaker scheduled a public hearing for December 19, 1951, in Owensboro, only to be taken suddenly by death a few days previously. This not only left our valley without a Congressman for sometime but with two comparatively new Senators burdened with all their tasks and difficulties so the league had to be patient until confidence and a working arrangement had been established. So now, at long last, we have come to the end of the rainbow and not only has the Louisville district engineer received the money to complete the navigation survey, but here we are in the midst of a public hearing before the Senate Public Works Committee. The agenda is taking in not only navigation but all of the other important phases so necessary for an over-all development. Thus, we can truly say that Quarterback Clements has heaved a giant forward pass from Washington, and in my mind's eye I can see the ball soaring beautifully toward the Green River Valley with its fine line in the field protecting its receiver to make the catch on the 10 yard line. Let us hope we are setting up an end-around play to [illegible] from economic slavery. This is a most wonderful opportunity, and the people of our valley will never forget this fine action on the part of Senator Clements.

Now, don't think for a minute that I am being partisan because the record shows that during a different political regime another forward pass was heaved from Louisville by the then district engineer, Col. W. A. Johnson, but unfortunately the citizenry of the valley was fast asleep and there was no team in the field as there is today. The so-called 1931 report was a "dream of dreams" including six or seven flood water-storage reservoirs and navigation locks and dams, irrigation, hydropower, etc. In castigating our valley people for their somnolence in the early thirties, I like to talk about the "lost 20 years." You all know of the Lost Weekend but our lost 20 years has been without benefit of even a small jag. The late Capt. Walter G. Hougland, of Calhoun, and myself favored the navigation aspects of the 1931 program but it was practically killed after leaving the Louisville office because no substantial support could be aroused in the valley for same. This, in spite of the fact that the late Congressman Kinchloe, a Democrat, succeeded in having the No. 5 Lockkand Dam on Green River and No. 1 on Barren River modernized early in 1933 which was part of the entire over-all navigation improvement in the 1931 plan. Since then the valley has received practically nothing. It is true, that Senator Clements while Congressman devoted considerable attention to the Green River Valley, only to have its people engage in a highly controversial debate. Consequently, we have no one but ourselves to blame for a lack of development

in the valley. This has resulted in huge economic losses that even defy estimation to us because it is patent, for example, that the Tennessee Valley would not have obtained the Johnsonville, Tenn., and Paducah, Ky., steam plants and possibly not the Paducah, Ky. atomic plant if we had available in our valley the needed constant water supply that will come with the desired water storage reservoirs. In other words, the Green River Valley would have been the ideal place for each one of these plants, with only this very modest and low-cost development plan. I recall during 1933 opposition in the Valley to the so-called 1931 plan but now it is a far different matter. Then we can only exclaim "Oh ye of little faith."

UNITED STATES DEPARTMENT OF AGRICULTURE GREEN RIVER WATERSHED CONSERVATION PROGRAM

It is not essential that one so inexpert as myself should discuss the economic aspects of this program, which aspects have been rather completely covered by preceding league speakers. However, it might be well to call your attention to this silhouette depicting the 1937 flood in the Green River Valley at its peak. To elucidate I will compare this silhouette with another showing of Green River at pool stage throughout its six pools, including that where the Green flows into the Ohio. These silhouettes are on a scale of 1 inch to 10 miles horizontally, and 1 inch to 10 feet vertically, which creates a rather magnified slope when it comes to the 1937 flood silhouette. That particular silhouette might remind some of a surrealist painting, yet to everyone it will demonstrate a rapidly plunging and destructive stream bringing to mind the colossal damage done by the 1937 flood with respect to houses, buildings, roads, bridges, foundations, and other things of value that were destroyed. Yet, upon reflection, these certainly were not the only and greatest losses suffered as a result of that flood and others. That statement might be astounding, yet when you ponder [pointing to flood silhouette] you will come to realize that it represents the two most important resources of the Nation, if not the world, not considering our human resources. Colonel Rhoads and I could probably debate for many hours as to which of the two resources, that is water or soil, is the more valuable, but that question is academic because there could be no life unless we had both of them. That being true, then why do we persist year after year in allowing these two resources to be wasted. Yes; a waste of the taxpayers investment. Here we can see them going, going, and gone into the sea never to be recovered except that we know the water will return sometime, somewhere in the evaporation process.

The soil, as Paley points out, is not renewable or replacable. Yet, the league has a friendly correspondent up at Scottsville in Allen County (and I hope he is here today), who seemingly has a complex about high dams and the Corps of Engineers. He asks, "What is in it for Allen County excepting the loss of some of its fine bottom lands?" There are many answers, but foremost is the one that [pointing to the 1937 silhouette] it is the fact that Allen County soil is rolling on to the sea never to be reclaimed. Then, too, almost every day during the current long drought, the papers carried a story on the Scottsville water shortage, in fact, they are building a costly pipeline to some springs eight or so miles away while Colonel Coin tells us of springs drying up. Could it be that Allen County really needs No. 2 Barren Reservoir? Then, let us chide our Kentucky Chamber of Commerce over its delay in supporting the Watts bill. In contrast our league said O. K. last February.

When such thinking is carried to a sensible conclusion, no one will challenge the United States Department of Agriculture's Green River watershed conservation program, except possibly as to some minor mechanics involved. It stands to reason, that no combination of so-called high dams could retain all the water pouring out of the valley during a flood like that in 1937, or the smaller one in 1913. Hence, we must become convinced that something in addition to the high dams is absolutely necessary and here again we come to the conclusion that the United States Department of Agriculture's Green River watershed conservation program is the answer beyond any question of doubt. That program is like a great blotter soaking up the ink on the desk only it is far more effective and the water is stored for future use. No matter how soon that particular program is placed in effect it will certainly be late. We do not say too late, but late because undoubtedly this program should have been launched years ago and as the years pass on we will become more and more convinced that we are late in launching the United States Department of Agriculture program. In my opinion this is an economic aspect of the highest importance.

FLOOD CONTROL

Now, going on in the consideration of flood control resulting from the proposed four high dams in the far upper reaches, we certainly did not want to underestimate the effectiveness of such dams because these are of supreme importance. For example, the so-called 1931 plan (Doc. No. 81, House of Representatives, 73d Cong., 1st sess.) at page 32 states "The result would be that 2,029,200 acre-feet storage would be utilized and reduction of flood heights would be 11.1 feet to lock 6, 8.3 at lock 4, and 2.5 feet at lock 2 from the 1913 gage heights." Now, 2 feet at Lock No. 2 at Rumsey may not sound like a very great deal yet during many floods throughout the years, this would mean the difference between excessive damage and none at all in a town like Livermore. In this connection I wish to file now a folder showing flood scenes throughout the Green River Valley on different occasions and especially those at Livermore. Here I am showing one where Mr. Karl J. Meyer, Jr., of the Green River Chair Co. is standing in about 2 feet of water which has already entered their warehouses. Obviously, if a situation of this kind could be averted by the four proposed high dams it would mean much to that company and also the Livermore Chair Co., of whose plant we have a number of pictures in this folder. During my more than 32 years in the Green River Valley I have always marvelled at how these two fine concerns have managed to continue in business year in and year out suffering one flood after another which sometimes come as often as two or three times in a single year. It simply reflects the excellent management of the Meyer and Render families in meeting this situation. Obviously, it is the league's opinion that the four flood-control dams in the far upper reaches will give Livermore complete relief from minor floods and if not, it is almost certain that the league will give serious consideration to the recommendation of flood-wall relief for Livermore which could cost comparatively little. Why not? Louisville, Evansville, Tell City, and Hawesville, have received millions of dollars and not one cent has been spent in the Green River Valley for a single flood wall or for flood control of any kind. This is certainly an economic aspect in my book.

WATER STORAGE

Beyond any question of doubt, if the Green River Valley is ever to amount to anything industrially it must have reservoirs to receive water during periods of heavy rainfall for use during periods of shortage. In fact, if the 1931 plan had been carried out sometime prior to 1940, which was logically possible with proper valley support, there is no question in my mind, as we said previously that the TVA Johnsonville, Tenn., steam plant and others would have been built right here in this valley because that would save the Government millions and millions of dollars in transportation charges on coal. Even if the Johnsonville steam plant was located at Bowling Green, Ky., the barging cost on the coal to that point from Butler or Edmonson Counties would not be more than 15 cents to 25 cents per ton compared with freight charges now being paid as high as $1.85 and $1.51 per ton on coal from western Kentucky mines to Johnsonville, Tenn. In fact, the TVA operates an obsolete steam plant of small capacity now in Bowling Green, Ky., but a plant of modern design and high capacity could not be installed there unless the so-called No. 2 Barren River high dam is erected to supply such a plant with a constant supply of suitable water. Now, all of this is certainly an economic aspect and should not be overlooked, because if we are to have coal-oil, synthetic plants, aluminum plants, carbide plants, steam-electric plants, and others requiring huge quantities of water constantly, it goes without saying that we must have these reservoirs created by the so-called high dams. Keep in mind that such water supply will not be created under United States Department of Agriculture watershed conservation program. With the four flood control dams in the upper reaches of the valley there is hardly any limit to the amount of water that can be supplied for industrial and irrigation and other uses. It must be recalled at this point that the Atomic Energy Commission located the new plant in southern Ohio for the simple reason that the electric power needed in huge quantities must be generated on the Ohio River where the necessary huge amount of water is available. And, this in spite of the fact that it will cost a considerable amount of money year in and year out in moving the coal by water, by river or rail, to the two contemplated steam-electric generating plants to serve the said Ohio Atomic Energy installation. Thus, we again have a duplication of the situation in the Tennessee Valley, of moving the coal to the water while here in the valley we would have the water adjoining the coal if only we obtain the said reservoirs.

Surely, this is an economic aspect of the highest importance. It is perfectly obvious that had the so-called 1931 plan been properly executed sometime prior to 1940, a much different economic history would have been written for this valley in the last 12 years. In fact, the valley would have been of enormous strength to the Nation during the late Second World War. There is no telling how many billions of dollars of income our valley has lost as a result of the "lost 20 years," previously mentioned. And we can go further and point out the enormous flood damages year in and year out during the past 10 or 12 years that could have been averted to some extent had the 1931 plan been heeded and executed. What a wonderful opportunity was missed when you consider the pitiful economic plight of our valley as related by Judge Wood.

ECONOMIC ASPECTS OF DRAINAGE AND CHANNEL MAINTENANCE

It is hardly necessary for this speaker to comment on this feature, because the benefits should be obvious to anyone after the presentation of Colonel Coin and his associates. The wonder to me is that the James R. Hines Corp. finds it possible at all to navigate the Green and Barren Rivers in their present condition. Undoubtedly Colonel Strong and Colonel West are now of the same opinion. In correcting this situation serious thought should be given to the recovery of the highly valuable soil that must be washed or dredged out. Could it in some manner be stacked on the banks to be hauled away by enterprising farmers? It is just like so much gold. And what about all those sawlogs, including those in the trees now standing upright in the valley's rivers? This is an economic aspect.

ECONOMIC ASPECTS OF COAL RESERVES OF GREEN RIVER VALLEY

At one time it was my opinion that our coal reserves are our greatest resource, but as previously stated this is not so because soil and water take precedence for obvious reasons. Nevertheless, in pointing to this fact I can see the day that here are the sinews for upholding the dignity of man throughout the world if not the universe. These resources are tremendous, and without question they are the greatest from the standpoint of quantity adjoining a navigable stream throughout the whole world. In making that statement we take into consideration the Great Kanawha, Big Sandy, Kentucky, Allegheny, Ohio, Monongahela, and Illinois Rivers. There is nothing even nearly approaching the coal reserves of the Green River Valley anywhere. The fact is that this is far too little known officially in Washington. However, we are rapidly spreading this information with good effect, as you will observe later from my talk. The sad fact is that the reserves lie entirely neglected with respect to river transport in the face of enormous demands that are already evident and are building up rapidly for river-transported coal.

REQUIREMENTS FOR RIVER TRANSPORTED COAL BY THE TENNESSEE VALLEY AUTHORITY, ATOMIC ENERGY COMMISSION, ELECTRIC ENERGY, INC., AND OHIO POWER CO.

A rather odd experience in the league's work is the fact that we have discovered the almost reluctance on the part of one branch of the Federal Government to advise or confer with another branch concerning a mutual problem. This is particularly true in connection with the growing coal requirements of steam-electric generating plants operated by or sponsored by the Federal Government. The league extended a special invitation to Mr. J. Porter Taylor, Chief of Navigation and Transportation Branch, Tennessee Valley Authority, to attend this public hearing, and as it is of such great importance to TVA we fully expected Mr. Taylor to attend, but instead his reluctance did permit him to write us on September 6, 1952, as per facsimile copy in my folder of exhibits here. He states: "Although we will not be able to attend the hearing, I am enclosing a copy of the letter which TVA sent to the district engineer at Louisville, Ky., on August 25, 1952. This letter sets forth TVA's coal requirements which could be partially met from the reserves along Green River through barge transportation providing Green River is improved to modern navigation standards. We do not believe that TVA can go further than furnishing these facts to the district engineer who is charged with responsibility of preparing the survey and report on the Green River navigation improvements." The estimated total coal requirements yearly for the 11 TVA steam plants is 18 million tons, and as TVA states Green River coal certainly could move competitively to 7 of the plants with consumption of 12 million tons a year. Now, let us consider the coal requirements of

Electric Energy, Inc., at Joppa, Ill., which is owned by a group of private utilities companies. At full production the plant is to supply 1 million kilowatts continuously to the Atomic Energy Commission plant across the river, which calls for the burning of 2,500,000 tons of coal yearly as a minimum, and most likely this can run up to 3 million tons yearly without question.

Here in my folder of exhibits is some information regarding the coal requirements of the Ohio Valley Electric Corp. (to be formed), which will supply the Atomic Energy plant in southern Ohio with electric power from one plant located at Portsmouth, Ohio, having a capacity of 800,000 kilowatts and another plant probably in the vicinities of Madison, Ind., or Carrollton, Ky., having a capacity of 1,400,000 kilowatts. This latter can best be served from our valley, and its coal requirements yearly will amount to no less than 5 million tons and possibly as much as 6 million tons. Thus, we have oncoming totally new requirements yearly for a maximum of 30 million tons, most of which must come from the coal fields of western Kentucky, southern Indiana, and southern Illinois. The best and lowest cost source of this coal would be from the Green River Valley providing we have modernized navigation as stated by the TVA. Without that the Green River Valley mines are practically impotent to supply the coal. As a matter of fact we desire to serve a solemn warning that these plants will not be properly coaled unless navigation in Green River is modernized immediately. Anyone having a knowledge of rail transportation knows that it will be wholly impossible for the railroads to carry this added load of coal. This is especially true in the event of an emergency under wartime conditions. Then why take chances on not preparing Green River to handle this load? It is simply a matter of five to ten million dollars, and we cannot see why action has not been taken long before this time, because certainly someone in Washington has been informed of the problems involved; in fact, our league has called the matter to the attention of Defense Transport Administrator Knudsen on several occasions but apparently these warnings have fallen into the hands of Mr. Knudsen's railroad expert, and of course no action has been taken although Mr. Knudsen personally has strongly advocated in public speeches the necessity for increased river transportation with or without a war emergency.

In our discussions of the subject we have heard that the railroads will revert to the use of so-called private cars by which a substantial number of existing railroad cars would be assigned permanently and solely to the hauling of the coal tonnage in question. God forbid that the coal industry be visited again with this demon. Time and again the Interstate Commerce Commission has ruled against the use of private cars and in this case the cars would have to come from the general pool, leaving a greatly reduced number to serve other coal users, which would mean that these would go largely without a coal supply. What is the solution? Firstly, to modernize navigation in Green River, which can be accomplished within at least 2 years if there is a will to accomplish the task. Secondly, but simultaneously, provide steel for building the necessary number of barges to haul the coal. Each steel barge holding approximately 1,000 tons of coal requires 140 tons of steel. The same amount of steel will build only six railroad cars and would haul approximately 330 tons of coal. Therefore, the ratio is 3 to 1 in favor of the river barges. The railroads will claim that they can turn the cars around faster than the barges, but this is not proved in actual practice, when you keep in mind that river tows now operate at night and during fog by the use of radar. Consequently, their turn-around time is almost miraculous. In the above estimate for river-transported coal we have not included the increased demands that are developing at points like Evansville, Ind., Louisville, Ky., Cincinnati, Ohio, Lawrenceburg, Ind., St. Louis, Mo., Owensboro, Ky., Alma, Wis., Jeffersonville, Ind., Winona, Minn., Rock Island, Ill., Davenport, Iowa, Dubuque, Iowa, St. Paul, Minn., Minneapolis, Minn., La Crosse, Wis., and many other places in position to receive river coal. The task is truly tremendous and will be formidable in the event of a war emergency.

SAVINGS POSSIBLE BY THE FEDERAL GOVERNMENT THROUGH MODERNIZED GREEN RIVER NAVIGATION

The discussion of transportation rates on coal is always an extremely dry and uninteresting subject to anyone excepting those in the coal industry. However, please remember that we are all stockholders in the greatest company on earth, the United States of America, and with taxation increasing almost yearly it behooves all to become more interested in the expenditures by the Federal Government. So let us discuss a few cases in point. From coal mines in the Green River Valley on the L. & N. R. R. the all-rail rate to Johnsonville, Tenn., on

the coal for use by the TVA is $1.85 per ton. This is a so-called Government rate and represents a reduction from something in excess of $3.50 when the coal is consigned to private receivers at Johnsonville, Tenn. However, please keep in mind the figure of $1.85 per ton. From I. C. R. R. mines in western Kentucky to Johnsonville, Tenn., the route is via rail to Grand Rivers, Ky., and thence by river at a total rate of $1.51. You will be astounded to learn that from the coal mines in southern Illinois through Joppa, Ill., and the river there is a rate of $1.35 which is 50 cents below the L. & N. rate from western Kentucky and 16 cents below the I. C. rate from western Kentucky. I know that none of you can imagine Illinois coal traversing the entire State of Kentucky in this manner and winding up in our back yard. In my book it is entirely incompatible and shows what the railroads can do to the Kentucky coal industry when they have a free hand. It is bad enough that we must pay differentials over the southern Illinois and southern Indiana mines when shipping to points like Chicago as shown by the rate map here. There is only one way to correct this situation and that is to modernize navigation in Green River. If that is done we would have an all-river rate from Green River Valley to Johnsonville, Tenn., of 99 cents, which would mean a saving against the L. & N. rate of 85 cents, against the I. C. rate of 52 cents and 36 cents against the southern Illinois rate.

As taxpayers, every one of you should be interested in having this saving brought about immediately. Since the Kentucky Chamber of Commerce has an affinity for the poor taxpayer, we appealed to them for help last November, but it has not been forthcoming. Wonder why? Keep in mind that coal is now moving to Johnsonville, Tenn., and this will increase substantially in the near future to a total amount of 2,000,000 tons yearly. To Paducah, Ky., from I. C. coal mines in western Kentucky the rail rate on coal is $1.28, and the same rate applies from southern Illinois mines all-rail, while with modernized navigation in Green River we would have an all-river rate of 69 cents per ton, thus making it possible for the Federal Government to save a total of 59 cents per ton. This is quite significant when it is understood that the Shawnee power plant at Paducah will consume 4,500,000 tons annually. The all-rail rate from southern Illinois coal mines to Joppa, Ill., is 95 cents per ton, while it is totally impossible to ship all-rail from western Kentucky mines because there is no rate to apply. With modernized navigation, the Green River Valley mines would have an all-river rate of 74 cents per ton, thus making possible a saving of 21 cents per ton. This is significant because the plant at Joppa will use at least 2,500,000 tons yearly and possibly as much as 4,000,000 tons. If the downstream plant of the proposed Ohio Valley Electric Corp. to serve the southern Ohio atomic plant is located at Madison, Ind., with modernized navigation, our Green River Valley mines would have an all-river rate of 92 cents per ton. This rate could not be met by any other mines of consequence, that is, in position to furnish a substantial amount of coal. For example, in eastern Kentucky, L. & N. mines could ship to Cincinnati by rail and thence by river at a total rate of about $1.91, which would be prohibitive compared with our rate of 92 cents. In addition, Green River Valley coal would be priced at the mine at least $1 to $1.50 under the f. o. b. mine price in eastern Kentucky.

Almost the same situation would exist if the said downstream power plant is located in the vicinity of Carrollton, Ky. Let us assume that after modernized navigation is established in the Green River Valley that a minimum of 6,000,000 tons of coal are shipped via river annually to these plants, which tonnage will more likely be near 10,000,000 tons annually. In that event, with an average saving of 50 cents per ton, which is entirely possible, the savings would amount to $3,000,000 yearly. Assuming that the modernization program would cost in excess of $6,000,000, which is an extremely high figure, it would seem entirely possible to pay for the cost of the modernization in 2 and certainly within 5 years. There is no other project that Uncle Sam can undertake that will return his money as quickly. It is just waiting for us, and the wonder is that the work has not started in the face of our constant warnings. In my folder of exhibits I have enclosed an endless amount of technical data on this matter.

ECONOMIC ASPECTS OF INDUSTRIALIZATION

It is perfectly obvious that with modernized navigation and a guaranty of a substantial and continuous water supply the Green River Valley would become intensely popular for the location of huge industrial plants. We have previously pointed out how coal-steam electric-generating plants could operate at a much lower cost in our valley under those conditions than the plants now being installed on the Ohio River and the Tennessee River. This is so because the

transportation on the coal to the plants would be largely eliminated. Therefore, the lack of modernized navigation and constant water supply is a very serious handicap to us. Looming on the horizon is the coal-oil synthetic-liquid-fuel industry not only to produce gasoline but to produce chemicals on a large scale. Obviously, we can qualify as the very best location in the whole wide world for such plants, providing we have the needed modernized navigation and constant water supply in substantial quantities which can be had with the flood-control dams and storage reservoirs in the far upper reaches as recommended.

In my folder of exhibits I am including an article from Fortune, September 1952, entitled "Coal Chemicals" reporting on the success by Carbide & Carbon Chemical Co., a division of the Union Carbide & Carbon Corp. At one point in the article it is stated, "* * * within 2 or 3 years it (Carbide & Carbon Chemicals Co.) expects to make investments in full scale plants of from $100 million to $400 million." The question is whether the Green River Valley will have assurances of the needed modernized navigation and continuous water supply in time to obtain one or more of these plants for which it is so ideally qualified. This does not involve any kind of financing by the Federal Government but is strictly a private enterprise. We have already contacted Carbide & Carbon Chemicals Co. asking them to advise as soon as they are prepared to negotiate. Another industry that we could qualify for with modernized navigation and water storage would be that of aluminum since it uses huge quantities of low cost electric power. With modernized navigation it would be possible to barge in the needed bauxite or aluminum pigs for fabrication. The valley could also qualify for a carbide industry which is growing very rapidly by reason of the huge quantities of materials furnished for various manufacturing processes including rubber, plastic, etc. There is hardly any limit to the industrial possibilities if they will only bring our facilities up to date. We are also filing with our exhibits print of an article from the Central City Times-Argus of July 3, 1952, indicating that the Green River Valley is an ideal area for the location of many synthetic liquid fuel plants according to the fiscal report by Ford, Bacon & Davis, engineers, New York City, to the Chief of Army Engineers. At one time this information was restricted, but has been released to this extent.

ECONOMIC ASPECTS WITH RELATION TO THE RAILROADS IN THE GREEN RIVER VALLEY

It appears that the L. & N. R. R. traditionally opposes all transportation on the inland rivers in competition with them. Most likely the I. C. R. R. take the same position, yet neither of these railroads at the present time is hauling tonnage that would be diverted to river transportation, excepting with respect to some of the coal tonnage that is now moving from I. C. mines in western Kentucky via rail to Gilbertsville, Ky., and river beyond to Johnsonville, Tenn. If some of this traffic should ultimately travel in an all-river movement at a considerable saving in freight charges of 52 cents per ton on ore, there could of course be no valid objections. At least, this is not a good reason for the Federal Government refusing to provide modernized navigation in the Green River Valley. Hereinbefore, we have stressed the difficulties that the railroads would have in moving the tremendous amount of new coal tonnage that is coming on to be supplied from the southern Illinois, southern Indiana, and western Kentucky coal fields. It would not pay them to acquire a huge number of cars even if they could obtain the steel in order to handle this new tonnage because in the end for obvious reasons the coal should be moved at the lowest possible cost. In any event, the coal industry is constantly losing business because of the excessive rail rates on one hand, while on the other, the railroad are not in position to reduce same according to their positions. The Paley report emphasizes that the cost of coal, both at the mine and plus transportation charges, has increased excessively and on that account much business has been lost to coal with further losses in sight. If the coal mines are operated at full time for three or four weeks in succession immediately there develops a serious car shortage and as a consequence the coal industry cannot produce to maximum capacity. This is a well known fact and as stated above it cannot be wisely remedied by the building of additional freight cars. It is perfectly obvious that both the I. C. and L. & N. can participate in the movement of a huge river traffic by establishing a very low train-load rate on coal of about 25 cents per ton from all mines to various Green River loading points. If this is not done the coal will be moved by overland conveyors or trucked or trammed at the lowest possible cost.

The IC has an excellent river crossing at Rockport while the L. & N. has numerous ones at Bowling Green, Livermore, Smallhaus, and Spottsville, while its lines come very close to the river at Sebree, Island, South Carrollton, Green

River, Central City, Paradise, and perhaps other points. Therefore, these railroads would not have to build new lines and costly facilities to take care of such traffic for barge movement beyond moderate equipment at the places where the coal is transferred from cars to barges. In addition, the said train-load rate of 25 cents per ton should apply to giant steam-electric, coal-oil, synthesis, and similar plants consuming huge amounts of coal. Thus, the railroads would profit from valley development as has been the case in every valley so developed. If the 1931 plan had been carried out in our valley, would not the L. & N. be profiting heavily today as is the IC around Gilbertsville?

ECONOMIC ASPECTS AS TO PAYMENT FOR THE PROGRAM

Under the United States Department of Agriculture conservation program for the Green River watershed, a part of the cost is assumed by those benefiting directly from the program. This is certainly a sound principle and the question arises as to why the Congress does not set up a similar policy with respect to those benefiting directly, for example from flood control-water storage, improved drainage, and modernized navigation? It is most difficult for me to comprehend that, for example, why the Ashland Oil & Refining Co. cannot afford to pay some kind of a very limited tonnage tax on every ton of its products moved over the inland rivers. Surely they cannot contend that such a tax is unbearable because it would be deductible from their income before calculating income taxes. Same is true with respect to other users of the inland rivers. However, presently I certainly do not think that the James R. Hines Corp. should pay a tonnage tax on Green River. In fact it should be the other way around, as the Federal Government should be paying Hines something for using Green and Barren Rivers in their present state. The user of great quantities of water for industrial uses should certainly be willing to pay a small charge, always providing that the principle is applied universally. The point is that some method should be set up to amortize these great expenditures as was done with the Panama Canal. I will go further to say that if the Federal Government refused to make the desired improvements in the Green River watershed unless modest taxes were paid as stated then most certainly there would be a chorus of voices indicating willingness to make such payments.

We cannot go on and on increasing the Federal debt without some method of amortization. Along this line, the recent suggestion by former War Mobilizer Charles W. Wilson, suggesting the exchange of stock in the Federal Government steam electric plants for United States Government bonds is undoubtedly a wise financial suggestion. We must keep our money sound and this can be done by the method of taxation suggested. In the Paley report a very modest sum is suggested for example, for the payment of industrial water service. The point is that if the farmers can stand a part of theirs, surely industry and the municipalities can stand a little on their part also. This is a rather far-reaching suggestion on my part and no doubt the Mississippi Valley Association will have me hung at sunrise for same, nevertheless, it should prove to all concerned that our league is not one to rob the Federal Treasury without restoring the funds for the benefits received. In my opinion, the toll should never have been removed from the Rockport Bridge, for example, until a giant bridge fund had accumulated for the construction and reconstruction of bridges throughout the Commonwealth. Of course a suggestion of this kind would never get a fellow elected for even dog catcher. There must be some reason in connection with paying for these and what I have outlined seems to be the most logical if it is applied universally, throughout the Nation. If applied to the Green River watershed program there is no question in my mind that the entire program would be amortized within a very short time of 5 to 10 years considering all the possibilities that appear ahead when once the entire program is completed. In fact, there is no end to said possibilities not only as to industry but as to agriculture and all walks of economic life.

Senator CLEMENTS. Thank you, Mr. Reis.

The reason we are having this hearing in the Green River Basin is that we can get a greater participation here than if we had it in Washington. Colonel Strong, it was a lot easier for you to come out of Cincinnati, for Coloniel Hiatt to come out of Washington, and Colonel Bidgood to come from Louisville, Colonel West from Washington, and the group in Agriculture to come from Washington

than it would have been for all of these groups to have made the trek to Washington.

Mr. Reis, I am glad you took more time than you said you were going to take in expressing your views and got those things off your chest and into the record. You have made a fine contribution to this hearing.

I am advised by Mayor Harding that Mr. F. H. Pope from the Kentucky Utilities has a paper that he desires to present at this time.

STATEMENT OF F. H. POPE, SUPERINTENDENT, KENTUCKY UTILITIES PLANT, SOUTH CARROLLTON, KY.

Mr. POPE. We of the Kentucky Utilities have played a small part in the development of the Green River Valley, and in the absence of our president, Mr. R. M. Watt, I wish to present this report.

The firm of Sargent & Lundy, engineers of Chicago, are employed by the Kentucky Utilities Co. to design and supervise the erection of the company's Green River, Tyrone, and Pineville generating stations, where substantial construction has been and is being undertaken since World War II.

In their report to the company, dated April 25, 1946, they rated Green River, based on their examination and on flowage and other records of many years, as having sufficient water during minimum flow of record to develop 100,000 kilowatts. Later, it was concluded that the present name-plate capacity of 60,000 kilowatts, and the name-plate capacity of 60,000 now being installed, could be efficiently operated by the record minimum flow of water.

They further stated that the mean flow, if regulated, would support all the capacity that could be developed at the site.

Other sites, separated a sufficient distance to allow some surface cooling between sites, are available for additional generating stations, and a regulated flow would furnish ample condensing water.

During the week of December 11, 1950, a group of engineers from Ebasco, Union Electric Co. of Missouri, and Kentucky Utilities Co. were engaged in the inspection and selection of a site for the generating station now being constructed at Joppa, Ill. The examination included sites at Joppa, Ill., in Kentucky near Paducah, and on Green River in the general vicinity of Paradise. The coal supply at the Green River site was found to be substantially lower in cost than that at any other site. Had regulated river flow been available, the Green River site would certainly have had distinct advantages over the Joppa site.

The coal resources available to Green River for water transportation are many times greater than can be consumed by generating stations located on Green River.

On the Ohio River between Cairo and a point near Aurora, Ind., generating stations now in existence or under construction are expected to consume at least 19,000,000 tons of coal annually.

Additional generating capacity now under consideration for immediate construction in the Tennessee Valley, according to information which has from time to time been published, will require at least another 13,500,000 tons of coal annually.

Thus, there is a potential new market available within the area mentioned in the foregoing of some 32,500,000 tons of coal annually.

With the installation of the large locks now being studied, the Green River Valley could supply a large amount of this coal at a substantial saving in transportation cost. Since a large part of the annual 32,500,000 tons of coal will be consumed for the account of the Atomic Energy Commission, the United States Government would participate directly as well as indirectly in the benefits.

Senator CLEMENTS. We have one more statement to be heard. I recognize Mr. Roy K. Wood, from the Fish and Wildlife Service of the Department of the Interior.

STATEMENT OF ROY K. WOOD, FISH AND WILDLIFE SERVICE, DEPARTMENT OF THE INTERIOR

Mr. WOOD. Senator Clements, ladies, and gentlemen, I am representing the United States Fish and Wildlife Service of the Department of the Interior, and witnessing the various statements which you have been hearing. It is a great privilege, and I am very pleased to attend.

It would be a mistake to come to this meeting and go back home without championing the fish and wildlife of Kentucky and of the United States. Fish and wildlife, the same as agriculture, power, and navigation, all depend upon the land and water resources and the flowing streams. It would be a mistake not to consider the fish and wildlife in planning for the development of this Green River Basin. First, our wildlife people for years have fought for an opportunity of having their considerations entered into the plans for the development of the river basin. Thanks to the foresight of Senator Clements and Congressman Watts, there was passed in 1946 a conservation act that has given us that privilege. Through river-basin studies, men can act in the field and make surveys of the fish and wildlife as related to the river basin. The activities in the Green River Basin are somewhat limited because our staff is flung to the far reaches of the United States. We recognize the importance of planning for fish and wildlife, and propose to continue our studies, requirements, and practices as best we can with the Corps of Engineers, the Department of Agriculture, and the National Park Service, within our own Department of the Interior. We would like to continue our efforts in this regard. Usually where you find good land use in most cases there is good wildlife. Where you find these reservoirs, most usually you find fishing contemplated—on Kentucky Lake, Wolf Creek Reservoir, and perhaps some of you are familiar with the fact that Tennessee is third in the sale of fishing licenses for nonresidents in the United States. Florida has the lead because of the tourist trade there for many years.

I want to appeal to you of the Citizens League to include fish and wildlife in the comprehensive planning for this basin. Thank you.

Senator CLEMENTS. Mr. Wood, it was out of your office in Atlanta that the location was determined for the Federal hatchery, and for which money was appropriated by the Congress that lately adjourned. There will be a closer relationship between the Fish and Wildlife Service in the National Government and the State fish and game commission. The State and Federal hatcheries will be in the same area.

Senator CLEMENTS. We have arrived at our question-and-answer period. I want to ask somebody in the Department of Agriculture

to explain again something I think was in their statement—the ratio of benefit to cost on this watershed-conservation program.

Mr. HUTCHINSON. Senator Clements, that ratio is 1.7 to 1.

Senator CLEMENTS. I have been asked what the ratio 1.7 to 1 means. There may be others to whom this is not clear.

Mr. HUTCHINSON. Senator, you get $1.70 benefit for each $1 invested.

Senator CLEMENTS. I didn't want anybody to leave here today thinking the cost of this project was going to exceed the benefit. You know so often we hear it suggested that the Government project costs so much more than the benefit accruing from it. Concerning navigation, I want to ask Colonel Strong what percent complete are the plans for the navigation project which was authorized by the Public Works Committee in 1949?

Colonel STRONG. With your permission, I will pass that ball to Colonel Bidgood.

Colonel BIDGOOD. I am the last man; so I can't "pass the buck." At this time we are about 70 percent complete on the report. The question of a two-dam plan instead of a one-dam plan has been injected into the problem.

Senator CLEMENTS. When you said one dam, did you mean the Spottsville Dam?

Colonel BIDGOOD. Yes; that is the first one. Before Colonel Strong can go before Congress and turn to his colleagues and recommend this, we have to know not only how much coal is available in that area but have to have some pretty good assurance of how much of that coal is going to move by water within the next 4 or 5 years. We don't know how much benefits it will produce, probably 50 percent saving; and, therefore, we have to get a pretty good figure estimating how much will move, say from 5 to 7 million tons, so the colonel can make his recommendation.

Senator CLEMENTS. By that statement I take it that you invite the full cooperation of the Green River Valley Citizens League and other agencies that might be mobilized in aiding you in accomplishing your objectives.

Colonel STRONG. Senator, they are cooperating, but we need some additional cooperation too.

Mr. REIS. You will get it, sir.

Mr. WALLACE. I direct this question to Colonel Strong. I wish to say, in the first place, I am representing directly, authorizedly, and by request 76,000 ardent advocates of right land use in members of the Izaak Walton League of America, of which I am past national president. I am representing also the point of view of all of the conservationists with whom I have been in contact during the discussion of the Mining City Dam. I wish to ask you wherein I shall be wrong, if I am wrong, if I represent to the Izaak Walton League and other national organizations that the Corps of Engineers was represented here ably and graciously, and there was a recognition of their assistance in that there was something said about possible modification of the Mining City Dam; but that nothing was said or indicated which might make it reasonable for us to feel that we would be in any way wrong to still contend that the only possible solution of this question is an act of Congress to take the Mining City Dam out of the Ohio Valley flood-control plan. I wish to say I ask that question with the deepest sym-

pathy with the Green River farmers who have said that what they wanted was the right sort of dam, because they haven't known how it was going to come from Washington.

Colonel STRONG. Mr. Wallace, I am not quite sure I understand for sure the impact of that question.

Mr. WALLACE. You said the fate of the Mining City Reservoir is in the hands of Congress.

Colonel STRONG. Congress determines the policy in these matters, saying which reservoir will be constructed. We only recommend. For the past 150 years Congress has had to expend many billions of the taxpayers' funds, and have had to depend on the engineers in many matters. At the beginning the Army had the only engineers, the only engineers in the country, and they have turned to us, and up to the present time have not seen fit to fire us. We are still acting in that capacity when called upon.

Mr. WALLACE. To the question "Is it not correct that the final say-so is in the mind and hands of Congress?" it is certainly correct, but when the late John Whitaker went to Washington as Congressman, full of enthusiasm to introduce a bill he wanted to introduce, he wrote to me that Congress will do what the Army engineers want it to do. [Laughter.]

Colonel STRONG. Mr. Wallace, I am afraid you endow us with too much power in this thing.

Mr. WALLACE. I refer to an article recently that can't be——

Colonel STRONG. Mr. Wallace, I am very glad you brought that point up. If you will refer to the testimony in the printed report of the Jones committee in Congress, you will find the statement of the article entitled "Big Dam Foolery" prepared before that committee and request——

Mr. WALLACE. I read the report, not once but several times. That is not the article I refer to.

Colonel STRONG. No, sir; but as to that report, ex-Engineer Peterson was asked directly, if he had read so much about the engineering lobby, could he give one single example in which the engineers had lobbied, and Mr. Peterson said "No, no, and no again," and finally in the course of the talk Mr. Peterson, asked by one Congressman, "Why, if you have only hearsay information on it, you report as a fact something you know is not a fact?—and that is what has been done in this case.

Mr. WALLACE. I ask the question I asked originally.

Colonel STRONG. You asked about the engineering lobby.

Mr. WALLACE. No; I only referred to the fact that somebody gave you. I asked you, in this case, would I be wrong, or would I not be, when I tell the Izaak Walton League what I know, and every other natural conservation organization with which I am associated, that nothing that was said by the engineers that gave any reason for us to discontinue our fight to prevent the dam being built at Mining City; otherwise, it would take an act of Congress.

Colonel STRONG. I think that is a very tricky question.

Mr. WALLACE. If you will pardon me, I think your statement was very tricky. After an effort to lay a pattern for peace you knew nothing about conservation to perform that modification——

Colonel STRONG. But there is a way; and, speaking for myself personally, I don't believe there is any man more interested in conserving our natural resources in every form than I am. We do not own the land in the sense that we have the right to do with it as we will. We really received the land from our forefathers, and we should in turn pass it on to our children in as good condition as we got it.

Mr. WALLACE. I think we received it from God. [Applause.]

Colonel STRONG. We received it from God through our forefathers; that is acknowledged.

Mr. WALLACE. I am not trying to beat a point in, and I am not trying to be clever; I am trying to get across to the Corps of Engineers, these officers, in an effort, that we were unable as conservationists. I believe that it is elementary that we are never through with the responsibility we feel that way——

Colonel STRONG. I do say that when we make final plans for this dam, if we feel that it is to the best interest of the valley, we will not hesitate to so recommend. We will go into a huddle when we build it with all the conservation agencies, and all the people and see that we get the greatest good for the greatest number.

Mr. WALLACE. I am not talking about wildlife; I am talking about national parks.

Colonel STRONG. You mean Mammoth Cave. No; the dam will not be built if it in any way interferes with the Mammoth Cave.

Mr. WALLACE. Who will be the judge?

Colonel STRONG. I suspect that when we go into conference with the Department of the Interior, and if we can't agree with them, then they will have a great deal to say about that.

Senator CLEMENTS. To further clarify the record, let me ask you if the Flood Control Act of 1950, which appropriated some additional funds for river-basin surveys, did not provide that no funds could be used on the construction of the Mining City Dam or any alternate of the Mining City Dam if that construction had any adverse effect on Mammoth Cave National Park.

Colonel STRONG. That is correct.

Mr. WALLACE. Mr. Chairman, may I ask you a question?

Senator CLEMENTS. I will recognize you in just a minute. I want to get the record reasonably straight. This law that is now on the statute books which forbids the use of any money by the Corps of Engineers to build any dam at Mining City, or an alternate, it would take the same action by Congress to repeal that act that it would any other law.

Colonel STRONG. That is correct.

Mr. WALLACE. There is all the law on the statute books today.

Senator CLEMENTS. There is a law on the statute books today that protects the Mammoth Cave National Park against any encroachment of the Corps of Engineers.

Colonel STRONG. That is correct.

Senator CLEMENTS. Mr. Wallace, if you want to ask me about any personal matters, we will defer them to another time.

Mr. WALLACE. Have you ever convinced the National Park Service—I know you haven't—that your law protects the Mammoth Cave National Park?

Senator CLEMENTS. I wouldn't say I have been able to convince anybody.

Mr. WALLACE. I have read the law and endeavored to interpret it, and have endeavored to get your lawyers to interpret it.

Senator CLEMENTS. Mr. Wallace, I am not a lawyer. I am a farmer.

Mr. WALLACE. How do you get along financially on the farm?

Senator CLEMENTS. If I tell you the condition of the farmers today in contrast to what they were 20 years ago, somebody would accuse me of making a political speech.

Mr. WALLACE. If you will allow me to, I will say this: Conrad Wirth, Director of the National Park Service, attributed to a group in Washington recently in which he said that every national park was in peril of being destroyed in exploitation of resources.

Senator CLEMENTS. I, too, have talked to Secretary Oscar Chapman and others in the Department of Interior. I want to say to you and in the presence of this gathering, that you, nor nobody else in this room is more interested in the protection of Mammoth Cave than I.

Mr. WALLACE. I can't answer that, you wouldn't let me answer it. I am interested in it. I have never been down around in it, but I am interested in it. I merely asked this question to get the record straight.

Senator CLEMENTS. I think it is straight.

Mr. WALLACE. I would like to tell you I am more interested than you are. I am not in it politically.

Senator CLEMENTS. I don't know how I could be any more interested than I am now. After I get out of politics I will be equally as much interested at that time as I am today, but I don't think I could be interested to a greater degree than I am today.

Who has the next question, and to whom will it be directed?

Mr. A. M. Stevens, Evansville Chamber of Commerce.

Mr. STEVENS. This is to Colonel Strong. Has there been a freight-traffic survey made on Green River?

Colonel STRONG. Mr. Bailey has been in charge of that study.

Mr. BAILEY. We made a freight-traffic survey of all traffic we can find on the river at the present time. You who are familiar with it know that the traffic is low and this is about the end of transportation of some of the commodities we may have had or were extensive at previous times. They are now extremely low for the reason that the facilities are not operating. But coal is not one of those commodities. By taking coal we reach a large tonnage because of the enormous potentialities that could be shipped on this river.

Senator CLEMENTS. Do you have a traffic survey, especially dealing with coal?

Mr. BAILEY. No. The final report will show all commodities and potential commodities to be shipped on the river.

Mr. STEVENS. Thank you very much.

Senator CLEMENTS. Mr. Robert J. Ball, of Louisville.

Mr. BALL (to Colonel Strong). Colonel, do you contemplate, or assuming that you are going to reconstruct these dams you mention, do you contemplate dredging the river before you do that?

Colonel STRONG. The dam itself will be merely one point in the entire navigation plan, which will give a 9-foot depth to fit in with much larger locks than we have now, which will require a great deal of snagging and some dredging.

Mr. BALL. Assuming you do that, in about 40 more years it will be filled up with so many trees you will have to build the dams higher.

Colonel STRONG. Not at present, of course, we will just have to take the trees out if the traffic continues and if the traffic they promise us appears on that river after we improve it, undoubtedly we will get funds from Congress to keep the river free of snags.

Senator CLEMENTS. What are your plans to clear the snags in the river at the present time, Colonel?

Colonel STRONG. Before this meeting, we had already ordered the Kentucky River snagging crew from there for work on Green River, and they are on their way and should be here in a few days.

Senator CLEMENTS. I recognize some folks are here from long distances. Don't any of you leave if you still have questions in your mind.

Colonel COIN. May I ask the engineers if they don't build a type of dam that is to a certain extent self-cleaning?

Colonel STRONG. No, the object of a dam is to hold the water, that wouldn't affect the snagging and silt further upstream.

Colonel BIDGOOD. We have 18 navigation dams on the Ohio River which are in continuous operation, and if they were ever designed to be self-cleaning, they drift in the upper and lower approach, and they have to be cleaned annually, but it is very minor.

Senator CLEMENTS. Referring to silting of the dam, to what degree would it lessen the silting in the dam if you had a watershed conservation program complete above the dam.

Colonel STRONG. It would help considerably. It does help materially, in fact, we consider it so important that the Clark Hill Dam near Savannah, Ga., was not started until we received assurance that soil-conservation practices would be enforced in the upper watershed.

Senator CLEMENTS. Bill Cardwell, of Madisonville, has a question.

Mr. CARDWELL. I am asking for information. I haven't heard anything said about Pond River. I live on Pond River, and of course, the backwater stays up until the water gets on out. Do you know about how much higher you aim to raise the Spotsville Dam if this project goes through?

Colonel STRONG. I can't tell you exactly what is going to happen to Pond River, I don't think anybody can. We have two plans under study for Green River navigation—one is to raise dam No. 1, that is Spotsville Dam, as high as dam No. 2, which would eliminate No. 2. The other proposal which we have pending is being considered as having a two-dam plan, with dams at the same height, all of which as I say, we are considering and which have to be built.

Mr. CARDWELL. Still you don't say how many feet you are going to raise it.

Colonel STRONG. Raise it 14 feet, that is the one-dam plan.

Mr. CLEMENTS. What will you raise it for the two-dam plan.

Colonel STRONG. Probably nothing, might not have to raise it at all, and then maybe it will be raised 2 or 3 or maybe 4 feet to eliminate the dredging.

Mr. CARDWELL. The dam that is now there is dirt, and of course, we are interested in the drainage there from our standpoint?

Colonel STRONG. Nobody knows that better than you do, how flat that water is.

Mr. CARDWELL. If you raise that dam 14 feet at Spotsville, that would make it stand that much deeper at Pond River.

Colonel STRONG. I don't know as it would make it stand deeper, but it would stay up longer. If the Ohio River is in flood stage, that would make it stay up longer.

Mr. CARDWELL. If you cut off 14 feet you are going to have more dead water than you have now, but we are not interested in that dead water so much, that is it couldn't cover the land there.

Colonel STRONG. That will be the rest storage when the waters come.

Mr. CARDWELL. It is not that storage we are interested in; it is this backwater getting out; our backwater stays longer on account of not having a way to get out.

Senator CLEMENTS. Bill, while you are here, representing the Pond River area, are you interested in the watershed conservation program?

Mr. CARDWELL. Certainly; we sure are, and we are interested in that backwater getting off as quickly as possible, too.

Colonel STRONG. I know this will be of interest to you all; these are important plans, and in planning the point is this, the one-dam system will be the best on the proposed navigation improvement, but it will take more land in the bottom part of the river than the two-dam system. However, if we find that an economic saving will not justify the expenditures of the two-dam plan, we will have to have the one-dam system where you have to have one-dam system or get none. You can't undertake a project that cannot justify itself; therefore, you have the one plan that is economical and one other plan that is not economical, and everybody appreciates the fact that those who have custody of the Federal fund naturally only recommend the projects that are economical.

Mr. CARDWELL. I have one more question that I imagine you all can answer all right. Pond River is dead 10 miles above the mouth from this dam here; now if you raise that dam 14 feet more at Spottsville, can you tell me how much farther up Pond River will be dead?

Colonel BIDGOOD. I can't. I don't have the figures on Pond River, but even if I did have, the conditions vary with the height of Ohio River and the amount coming out of Green River by Spottsville. That varies from time to time. Considering the flow of the two, there is no definite answer I can give; I can't say that 14 feet higher would make 14 miles.

Mr. CARDWELL. We are talking about when it is dead, when it gets to a dead standstill. I am talking about a flat pool.

Mr. BAILEY. Unfortunately, we do not have the information with us; we can't tell you how far it will go.

Senator CLEMENTS. Is that information available in your office?

Mr. BAILEY. It will be, I think; we have that in this record.

Senator CLEMENTS. Let me suggest to the reporter that she reserve a place in the record at this point for that information, and let me further suggest to Mr. Bailey he prepare these data in duplicate, sending one copy to Mr. W. E. Cardwell, and one to the reporter.

At the public hearing at Central City, Ky., on September 20, 1952, Mr. W. E. Cardwell requested that certain information be obtained regarding Pond River. The following information has been furnished Mr. Cardwell and should be inserted in your record of the hearing.

Under existing conditions, the water for the flat pool of Green River Dam No. 1 at Spottsville backs up Pond River a stream distance of 11¼ miles. With a replacement dam with pool equal to that of Green River Dam No. 2 at Rumsey (elevation 363.4 feet above sea level) the flat water pool would back up Pond River a stream distance of 26¼ miles.

In general, the tops of the banks of Pond River vary in elevation from 370 to 380 feet, which indicates that, under flat-pool conditions, the stream would be contained within the stream banks by several feet with the higher pool elevation of 363.4 feet.

Provided by C. Bidgood, lieutenant colonel, Corps of Engineers, district engineer.

Mr. CARDWELL. I would like to say this has been mighty interesting, and we have learned a lot, but we were particularly interested in Pond River, and that was one of the reasons we were here, and that was the only reason.

Senator CLEMENTS. All of the studies have not been completed by the engineers, as previously stated. I am certain information gained by future studies will be made available to all interested parties.

Is Mr. O. F. Floyd, from Lincoln County, in the audience? Mr. Floyd has traveled the fartherest distance of anyone from the Green River Basin area attending this meeting. Would you like to make a statement, Mr. Floyd?

Mr. FLOYD. Thank you. I have been wondering whether to ask a question. I don't know whom to ask, and that is: why we haven't had this on-the-land conservation already started. As a matter of fact, we have started it in Lincoln County, when this matter came up some 2 years or more ago. While the survey was being made, we conducted a meeting in the upper Green River Valley, and we tried to educate the farmers there, in what it would mean to them to have this in effect. When the review or survey was made at Glasgow, five of us attended that meeting, and on the way home we decided that we would circulate a paper among the farmers of upper Green River to see how they felt about the matter. All the farmers from that region were with us. We wrote a paper, I don't remember the exact wording, but it was something like this, "I hereby agree to cooperate to the fullest extent of my ability with this Green River project, as outlined."

These two men carried that paper 2 days, and each one had a separate paper, and they did not find a landowner who objected to signing it. They covered that territory until better than 60 percent there signed it, and they said: What is the use of going further. Those men have been waiting and expecting things to start now for more than 2 years. We have in our soil-conservation district work done, got a lot of that work done in that area, and we conducted an air tour in June a year ago, or July it was, and the tour went over that region, and attention was called to designations as to what this meant, and since that time farmers have begun to clean up the stream beds entirely on their own. Just last week one farmer completed cleaning the channel through his entire farm at a cost of more than $1,000, hoping that this thing was going ahead, and cleaning it out above and below as quickly as possible. What our farmers want to know is why can't we get on it now, and quickly. I believe that is all I want to say, and thank you.

Senator CLEMENTS. I believe you have a joint resolution of the Green River Citizens League and other groups. Mr. Chase, will you withhold that? Mr. Brock has a question.

Mr. BROCK. On this $29 million to be collected from private industries, where does that come from?

Senator CLEMENTS. The Department of Agriculture will answer your question.

Mr. HERTZLER. That is the cost to be supplied by the farmer in terms of labor and services that he provides to establish these measures on his own lands in return for which he receives the benefit for increased protection, its value is equivalent to that.

Senator CLEMENTS. Is this not the same type of soil-conservation program now operating in the existing soil-conservation districts?

Mr. HERTZLER. That is correct.

Mr. BROCK. That is fine, one more question. Do the Corps of Engineers know what is going to be done in Greenup, Adair, and Casey Counties?

Senator CLEMENTS. I don't get the question.

(Question repeated.)

Colonel Strong told us those surveys were made in the late twenties or early thirties. He expressed the opinion that conditions have changed economically, and before any project would be recommended to the Congress, a review of the area would be made by members of his staff. I would like to ask Mr. Hertsler what percent of the Green River watershed is now covered by operative conservation districts.

Mr. HERTZLER. I am afraid I can't answer that, perhaps Mr. Chinn can.

Mr. CHINN. I understand that more than 80 percent. All but one county and part of another out of 31 counties.

Senator CLEMENTS. Out of 31 counties. How many districts in the 31 counties?

Mr. CHINN. There are 29 conservation districts in the 31 counties.

Senator CLEMENTS. Mr. Ruby Jackson, from Madisonville, has a question.

Mr. JACKSON. I, too, am interested in what provisions, if any, Colonel Strong, are being made to dredge the smaller streams and tributaries that empty into Green River. As I stated a minute ago, I am interested in Pond River and two or three of its tributaries. What are they considering in their plans for Pond River? I will put it this way, Are there plans to dredge these streams?

Colonel STRONG. Are you talking about the other streams that enter into Green River that do not have proposed dams on them? There is no reservoir proposed on Green River. At the present time there is no authorization for any dredging on these streams. There are survey reports on some streams assigned the Corps of Engineers, however, funds are not available at this time to carry on the survey.

Senator CLEMENTS. Are you far enough along with your plans and studies that you could tell us whether or not there will be recommendations for Pond River?

Colonel STRONG. As far as the navigation study is concerned with Pond River, there would probably not be any recommendations made on it, as that does not affect the navigation on it.

Mr. HERTZLER. In the Department of Agriculture program there is a measure for channel improvement and stream stabilization. That measure applies to small streams. It includes channels, snagging, some dredging of 2,700 miles of the tributary streams within the Green River watershed.

Mr. CASE. Did you ask the Green River Citizens League about the resolution made with——

Mr. WITHERS. Mr. Bailey, in relation to the drainage, if you raise the Spottsville Dam 14 feet, wouldn't that affect all the creeks and

drainage that empties into Green River and back to the point where all this sediment runs all the way upstream?

Mr. BAILEY. I wouldn't say all of them, it might affect some of them.

Mr. WITHERS. I am talking about dams Nos. 1 and 2.

Mr. BAILEY. I understand it would affect some but not all of them, probably.

Mr. WITHERS. Why wouldn't it affect all of them, if it reached the stage all the way above 1 and 2?

Mr. BAILEY. Some have conditions that take the flow very well.

Mr. WITHERS. Do you know of any?

Mr. BAILEY. I haven't been down personally on that survey, but some of my field boys have been down. You take Deer Creek, which is several miles above dam No. 1. It has 4 or 5 feet of dead water in it all the time.

Mr. WITHERS. That would be true. You take Cypress Creek on Pond River, and Pond River as you well know, or the people in that area know, it is a flat stream anywhere in the county. You are going to find considerable opposition throughout Union, Webster, McLean, and Hopkins Counties. Those are things which I hope will not be overlooked, and I know some of those people were here today directly interested in whether or not their drainage was going to be affected in that area and they ask me to speak for them.

Colonel STRONG. We are looking into it, Senator.

Mr. WITHERS. This is a thing that must not be lost sight of in determining whether you build one or two dams, the potential damage that might result. The potential damage that might be suffered by all the property in the area, if that were sufficient it might justify two dams instead of one.

Colonel STRONG. That certainly will be considered, and, of course, we would have to reimburse the landowners, every man damaged would have to be reimbursed, and that might make the difference between the building of one dam or two.

Senator CLEMENTS. Mr. J. F. Miller, Ohio County, has a question.

Mr. MILLER. I want to ask the Corps of Engineers, how fast is Green River proper, how fast in the last 20 years, or how much has Green River in the last 20 years filled in?

Colonel STRONG. That question cannot be answered, because for this reason, we have had navigation, as you know for over 100 years, and in certain places you have trees, slide-ins, and you have shallow spots, and other spots on angles the survey shows no decrease in depth whatever. Those are local conditions where the slip-ins come in a river. There has been no noted rise in the bottom of Green River since we have been in charge.

Mr. CHASE. I would like to have you do what I asked awhile ago to present our joint resolution. Mr. Hagan will speak for the groups.

Senator CLEMENTS. The Chair will recognize Mr. R. Murray Hagan, of Owensboro.

Mr. HAGAN. Mr. Chairman, Your Excellency, and other distinguished guests. I hate to break up this very interesting and amicable discussion for minor details. The chairman said awhile ago that he thought all the groups were to be heard. I have the honor of representing the Agricultural Association which is backed by the directors of the farm bureaus in four counties, namely, McLean, Webster,

Daviess, and Henderson, whose members represent 4,300 farm bureau farmers, and if you will multiply that by four or five, that will represent a rather sizable segment of 430,000 people who live within the Green River watershed. Mr. Cardwell raised a question about a very pertinent point, about the drainage over here on Pond River, which is very pertinent to Daviess County. Gentlemen, this is not altogether guess work with us. I had the opportunity of checking with the geological survey when working in our district. I got the level marked on the streams and on the estimation of the County Agent Mr. McClure, and some of these made the statement that 300,000 acres in Daviess County would be affected by the raising of the Spottsville Dam 14 feet. When you go out there and check the geological survey you will find that it isn't too far wrong. Henderson County comes in with 12,000 to 14,000 acres affected. With McLean County, perhaps along the upper drainage area, is the only one directly affected. I don't know how much in Webster, and that we would like you to respectfully consider when you are locating and where you are locating these dams. Now to keep the record straight, there is a conclusion that the residents have been seemingly anxious to cooperate, and we are both asking for the same thing, and maybe with a definite approach and we want improvement in navigation or the channel improved in Green River. I was born and raised on the banks of Green River. I could stand on the front porch and throw a stone into Green River, and you can see it wasn't yesterday that I was born. I know as much about the lower 50 miles of Green River as anybody here; and I do know that we need relief in flood control and navigation, if it is economically sound, and we went into a joint resolution with Green River Citizens League one night, and I will be glad to read the resolution at this time.

Whereas the board of directors of the Green River Valley Citizens League, Inc., met in session at Beaver Dam on August 26, and empowered its undersigned representatives to promulgate this resolution; and

Whereas the board of directors of the Green River Agricultural and Drainage Association met in session at Owensboro on September 18, and empowered its undersigned representatives to promulgate this resolution; and

Whereas the United States Senate and House of Representatives Public Works Committees will hold at Central City on September 20 a public hearing on the over-all development for the Green River watershed; and

Whereas the representatives of the two aforesaid groups met in joint session at Owensboro on September 18 and in said meeting the separate groups empowered their representatives to enter into a joint resolution pertinent to the matters under discussion: Now, therefore, be it

Resolved: 1. The United States Army Corps of Engineers be advised that it is the consensus of our respective groups that the present normal level of Green River No. 1 pool be not disturbed.

2. That the United States Army Corps of Engineers be requested to give serious consideration to the proposition of moving the dam presently located at Spottsville to a suitable location upstream above the mouth of Panther Creek watershed in accordance with a resolution passed March 28, 1951, by the United States Senate Committee on Public Works.

3. That the United States Army Corps of Engineers be advised that it is the consensus that the dam presently located at Rumsey, above Longfall Creek, should be replaced by a new dam in the very same location.

4. That our groups join in support of the over-all development program for the Green River watershed as described in the formal notice of the aforesaid public hearing with the exception that the Green River Agricultural and Drainage Association reserves the right to pass final judgment with respect to the so-called Watts-Underwood bill for the purpose of obtaining the desired additional information with respect to the same; and be it further

Resolved by the committees in joint session, That R. M. Hagan, president of the Green River Agricultural and Drainage Association, and chairman of the joint session of committees, be empowered to read said resolution before the public hearing September 20 and to file a copy in its records.

The purpose of this association is to promote the development of the Green River Valley, and to oppose any project injuring the agricultural land of the area by flooding the drainage system of such land, I am speaking of the Green River Agricultural and Drainage Association.

Mr. WITHERS. How far above the mouth of Panther Creek is the present dam?

Senator CLEMENTS. Can you tell him Colonel Strong?

Colonel STRONG. Twenty-eight miles, I believe.

Mr. REIS. Twenty-three miles, I believe.

Colonel STRONG. We are willing to cooperate with any cooperative organization. It is perhaps 20 miles above the dam and 28 miles above the Ohio. We want to say, and I am addressing this to our Congressmen, who are economically minded in their deliberations in Congress, and if we think it is economically feasible, we are for it, and if it isn't we are not for it.

Mr. WITHERS. Do you mean to leave it at the present water level between 1 and 2?

Colonel STRONG. Yes, there will be less than 1 inch. There will be a little dredging between No. 1 and the mouth of the river.

Mr. WITHERS. That would help the drainage and it wouldn't hurt the people in the Pond River and McLean regions, they wouldn't be changed any.

Senator CLEMENTS. Are you interested above dam No. 2?

Mr. WITHERS. No we are interested below, we are 16 miles above Spottsville. I mean the association itself.

The association is in the four counties, that would extend to dam No. 2, McLean and Webster would be checked and their condition isn't any worse than before. The point Mr. Cardwell raised is a pertinent point to drainage. I hesitate to take any more time.

The Senator asked if you were interested in anything above dam No. 2.

Mr. HENRY WARD. If the flood-control program will keep the flood off the lower Green River, they would be interested.

Governor WETHERBY. You are interested in any dams above that would affect the flow of the water, you wouldn't want the level raised in pool 1 and 2.

Mr. HAGAN. We set out in this resolution.

Mr. WETHERBY. To Colonel Strong—Colonel Strong is there any conflict between your department plans and the plans of the Agriculture Department known as the Watts bill?

Colonel STRONG. None whatsoever, that is irrespective of either plan that is recommended, one is concerned with land treatment and on-farm drainage and the other is concerned with navigation and flood control.

Senator CLEMENTS. Neither plan would be in conflict with the agricultural plan nor the Watts bill.

Mr. HAGAN. Gentlemen, I have read the Watts bill, and I want to apologize for not knowing any more about it. The idea I see in it, the direct contract, as the saying is "The big print gives it to you and if

you don't watch, the little print will take it away." We need a little more enlightenment on the Watts bill, these privately interested employees, and how their share will be allocated.

Senator CLEMENTS. Mr. Carol Byron can advise you about the meaning of any part of the act you don't understand, or not brought out specifically in this hearing.

Mr. HERTZLER. I will be glad to answer that question, all this is done in this report House Document 261. In the first place you asked how it was allocated. It is allocated on the basis of past experience within the watershed. The way it is done, it is worked out with the dam plans or subwatersheds, and the Department of Agriculture works principally through the soil conservation Government supplies, technical services, and supplies educational facilities, normally through the heads of these, and that the non-Federal share is supplied by the farmers in types of labor, the Federal Government will share up to 85 percent of the total cost.

Senator CLEMENTS. Who pays the remaining percentage of the channel improvement?

Mr. HERTZLER. The Federal Government would expect the local organizations, such as drainage districts that receive the benefit, the soil-conservation districts that receive the benefit, and other groups who are interested. When it comes to soil conservation we are willing to pay for that.

In the program of the Department of Agriculture on the tributary stream not on the main stream, we have not claimed any profits for the main stream, and, therefore, we would not expect the people who use the main streams to pay all of the cost. The Government assumes that totally, and we have no measure in our report for them. That would revert back to the Department of Defense.

Mr. HAGAN. Would the $20,000,000 be paid by other interested parties? That is one thing that may be paid by the landowners on the basis you carry on conservation practice in conservation districts now.

Your Department don't claim any benefits, you mean direct benefits, other than the main stream.

Mr. HERTZLER. You do claim benefits, but indirect benefits other than on Green River watershed and the tributaries. That's right, there will be other benefits.

Senator CLEMENTS. Mr. Arch Moore has a question.

Mr. MOORE. My question is addressed to Mr. Hutchinson; it has to do to some extent with the project Governor Wetherby suggested, and I want to ask this question: Is it not right that the historical facts are that the floods have risen with the contemporary abuse of the land, that if and when the Watts bill improve the practice, if that within itself will not contribute and control a major portion of the floods in the valley?

Mr. HUTCHINSON. I wouldn't say contribute a major contribution; it would depend on how you would define that work. We have claimed 28 percent can be reduced as a result of our program. There will be many benefits on the flood plan, because the conservation program on the land will reduce erosion and thereby reduce sedimentation, which reduces the capacity of reservoirs to retain floodwater. If we improve the stream channel for the purpose of getting the floodwater

off, and if we reduce sedimentation as well as the runoff, then we will have all the benefits downstream and during the flood and the plan will carry on into the main stream on an even plane.

Mr. MOORE. Then indeed you say that the practices under consideration in the Watts bill will constitute a material improvement to flood control in the valley.

Mr. HUTCHINSON. Yes, I would claim that.

Mr. MOORE. I would like to address this to Colonel Strong: In view of the fact that the Watts bill, according to the experts, will materially reduce the floods in the valley, coupled with the proposal of the Green River Valley Citizens League, and the four upstream dams being built, and further projecting along the line suggested by you this morning that the dam on the lower Cumberland be built, isn't it possible that the Mining City Dam might not be necessary and be eliminated entirely? This would eliminate the entire cost and prevent an economic waste by 65,000 to 100,000 acres of land.

Colonel STRONG. What you say may be possible but I couldn't say with assurance what the finding would be until the studies are completed.

Mr. MOORE. In the headwater plan which you spoke of, that will not only protect the main stream, but will alleviate flooding in the headwaters on the main stream.

Colonel STRONG. The program on water conservation is in the upper headwater area with the chief benefit on the land. There will be little benefit on the main-stream floods. After we build the four reservoirs we spoke of, what still remains to be done to get additional flood protection by modification of the Mining City Reservoir will have to be determined in our further studies.

Mr. MOORE. Then you are not irrevocably committed to the fact that it is absolutely essential to the proposition laid down by me that the dam be built.

Colonel STRONG. We are not committed to either proposition until we know more about it in the light of 1952 information and the lower Cumberland plans.

Mr. CHASE. Colonel Strong do you think it is at all feasible to place No. 1 dam above Panther Creek and still maintain a 9-foot channel up to No. 1 dam if it were put in that position.

Colonel STRONG. That would require detailed engineering study, first of all as you go upstream level with the Ohio River, you will probably need to dredge to get the depth you need. We are making a study of the 12-foot channel of the Ohio River and ultimately it might mean a higher pool level on that stream; this in itself might make it possible to put the dams on the Green River above Panther Creek.

Mr. CHASE. That is quite a ways in the future?

Colonel STRONG. How soon in the future depends on how soon the country as a whole decides the time has come to go on with our investigations throughout the country, which have been deferred during these years of emergency.

Mr. CHASE. I would like to urge you to do what you can in Washington in the seats of planning, that will eliminate the improper drainage in Daviess County.

Colonel STRONG. We know comparatively the interest of the drainage people themselves and what the navigation people want, and we would like to adjust it without either one hurting the other, it might

not be done; because of the expense, it might not be economical. I will have to go back to my protection, I can't give a final answer now.

Senator CLEMENTS. Mr. E. G. Lindeman of the Green River Chair Co. of Livermore has a question.

Mr. LINDEMAN. There has been a lot said about drainage, conservation, but very little said about flood control. At Livermore we are right interested in flood control. What we would like to know is just how much the crest of floods will be lowered when the dams are built. They say 28-percent reduction in flood damage, but there is no indication of how high the flood crest will be when it reaches Livermore.

Mr. HERTZLER. We have not calculated the reduction of the flood crest, nor have we calculated any damage reduction.

Mr. LINDEMAN. As I understand this flood control in Green River Valley, what are we going to expect?

Senator CLEMENTS. I doubt if they are hearing your question, Colonel Strong, did you get Mr. Lindman's question?

Colonel STRONG. I know what he wants to know, what everybody in effect wants to know, when the dam is built, how dry are you going to be. You want to know what the flood crest will be. The closest thing I have to answer is from the 308 studies which dealt with the original seven dams. They would give a reduction at lock No. 2 in the 1927 flood, of 5.6 feet; the 1922 flood, 15.7 feet; and 1916 flood would be reduced 5 feet, that is at lock No. 2 on Green River. That is as close as I can come to answering your question at this time.

Mr. LINDEMAN. The reason I am asking is that in 1950 we had headwater in our factory for 6 weeks of 30 inches. It stayed there longer then than it did in 1937 when the water was 6 feet for a while.

Colonel STRONG. If we get the studies which we are authorized to complete, the flood-control studies for 1952–53, then we will have some answer to turn out. There will be a substantial reduction from the construction of the four dams, but I cannot say how much it will be in feet at this time.

Colonel BIDGOOD. Were you speaking of headwater in 1950 or backwater from the Ohio River?

Mr. LINDEMAN. Headwater.

Senator CLEMENTS. Mr. Moore, do you have a question?

Mr. MOORE. I will ask Colonel Strong: The people between dams Nos. 1 and 2, you can very easily see that in that area, when you talk about bringing the dam up to 14 feet, they think of the flooding of the farms. The way the farmer believes about the thing in crop season, that is what the people are interested in at that particular time. We can't put wickets in this dam when usually the Ohio isn't flooded at that time. I am trying to bring out the question and if we do it that would be wonderful but I don't believe I can do it. Those people are very much opposed to that. A great number of us would like to see the valley with its natural resources, much more progressive than we have been. I was born and raised on the Green River. You folks can understand what I am trying to say. In the fall, I am not thinking of the fall rise in 1937. I believe there was more water then than you can dam up or do anything with. I am thinking of springtime. If you put wickets in the river say at dam No. 1, I definitely believe that the water can be controlled and make the farmers happy. Often that water covers acres of ground; it isn't over 2 to 4 feet rise, but it drowns out crops. Am I right or wrong?

RESPONSE FROM AUDIENCE. Right.

Mr. MOORE. We can get in there very easily and take care of that if we had 10 or 40 barges. This great mass of coal might have to ship out by train. If that only requires one wicket to hold it out of the bottoms, you would still have ample water for any amount of those barges. Now, then, in the fall we cannot control that water. We have too much. Regardless of whether the dam is raised 14 feet, it will have more water than you can use. I believe on that plan that it can be worked out, and I believe we can solve all the problems and have all the water that you can use and have ample water from this, or more water than you know what to do with, and hold back any amount of water you want to. The dams on the upper end, that will be all right for any purpose you might use for flood control. I do believe this situation could be worked out on this basis. I hope I make myself clear on that point. I think I can certainly say what the dam itself would do. When the pool is a certain height you can lower it, but still the river is higher if you are going to get a certain traffic depth, of course the water must be up to a certain level or the coal isn't going to move.

Senator CLEMENTS. Mr. Harding is recognized.

Mr. HARDING. I would like to make a statement in regard to the resolution read by Mr. Hagan. Green River Valley Citizens League has been represented down at Henderson in a pretty bad light when we tried to convince those people that 14 feet on top of the Spottsville Dam wouldn't hurt them, and they have convinced us that it will hurt them. We are on record, in that resolution read by Mr. Hagan, that we are not in favor of a rise of 14 feet on top of the Spottsville Dam; we are in favor of the two-dam system; we think it is economically feasible.

Senator CLEMENTS. With further reference to the question asked Mr. Hertzler by Mr. Hagan dealing with the cost of putting into operation the watershed conservation measure, it has been brought out in 29 of these 31 counties that the Federal Government and the landowners are working jointly on a conservation program. What is the amount of money the Federal Government is putting into those counties for soil conservation?

Mr. HERTZLER. The report I would like to point out says that about $1,500,000 is the annual program of the Department of Agriculture for those measures which are the same ones present in the report. Since that time, just recently we have recalculated the figures and expressed it in terms of a 20-year program, a full program set up in the report. The present rate of installation of these results of land-treatment measures would cost in the 20-year period about $54,000,000. That is at the present rate of application of these measures. We figure that what is needed in addition to that is the equivalent of $86,000,000 above the 20-year program; $86,000,000 is the total equivalent program, $54,000,000 is what would normally be installed over a 20-year period or now being installed, making a total at the end of the 20-year period of $141,000,000.

Senator CLEMENTS. Do you have the approximate amounts the landowners are annually investigating in this program?

Mr. HERTZLER. No; I do not have that exactly, but I would estimate over one-third; from one-third to one-half million dollars, at least that.

Senator CLEMENTS. If this program is authorized do I understand that the Federal Government will pay approximately $56 million of the $80 million cost?

Mr. HERTZLER. That's right.

Senator CLEMENTS. And the landowners and other local interests put up the balance?

Mr. HERTZLER. That's correct.

Senator CLEMENTS. Then the ratio between the Federal Government and the property owners is approximately the same as it is on the program now being conducted in the various conservation districts?

Mr. HERTZLER. Approximately so; one minor difference, and that difference is in the structural measure, gulley stabilization, and the Federal Government would expect to pay a little more. That is the only difference.

Senator CLEMENTS. I gather from your statement, we might think in terms of this building an enlarged soil-conservation program in the watershed. It would step up the present program so that the completion date would come much sooner with the enlarged program.

Mr. HERTZLER. That's right, with one minor correction; rather than a soil-conservation program, it is a general conservation program including such things as forestation.

Senator CLEMENTS. I agree that sound forestry practices are just as important as any other part of this work.

Mr. WARD. You may remember this morning in my brief comment we said we had experts who were ready to go into more detail. I think perhaps it is unfortunate that because in this consideration we have skipped some experts on the Department of Agriculture program. I think it is a mistake for the group to go away misunderstanding what is involved. In the first place it is a voluntary program, the whole thing is voluntary practice. The landowner determines what is to be done, that ought to be definitely understood. It is a cooperative thing, we carry out this way, and under this practice. That definitely ought to be understood, in terms of what someone else put into the program. If he didn't put it in, the Federal Government wouldn't put it in. It would be an acceleration of the present program, which is doing a fine job in most counties of Kentucky. All except one and one-half counties in the entire Green River Valley have soil-conservation districts; they are Henderson and one-half of Daviess, and all of the others are in soil-conservation districts now.

I think the landowners understand what the situation is. There is, I think, some misunderstanding because of some technical stuff that the Department of Agriculture is hesitant to argue with the Corps of Engineers, who are admitting the practice is pretty good. It stands to common reason that if you have over a wide river basin a 3-inch rainfall, that the river in the lower regions is going to rise more if the runoff in the upper region is slower. If that is true, the control of the rainfall in the upper regions would have its effect on the level of the river. We will ask Mr. Chinn, who is an engineer, if that is true?

Mr. CHINN. Thank you, Mr. Ward. I notice the Department of Agriculture is very modest in its claims, so are the Corps of Engineers; neither one claims to have the complete answer of flood-control problems. I think both programs can do the job completely. One thing

that was mentioned this morning and was very interesting to me, Colonel Rhoads said for 50 years Rumsey Bottoms was not flooded, under those conditions as mentioned today that might mean the same thing. There is no question but what this program mentioned today, although it might not mean too many benefits on the main stem of the stream when you have a 3½-inch rainfall, when you have a 2-inch rainfall you would have a lot less flood. Does that somewhat answer your question?

Mr. WARD. That answers it about as well as you can get any engineer to make a positive statement.

Senator CLEMENTS. Anyone who wishes to file a statement for the record today will present it to the reporter. Those who may wish to file a statement at a later date will advise the reporter before leaving the meeting and the reporter is authorized to accept the statement at a later date.

Mr. WITHERS. I want to add my own idea to this, that any report that is made to me I will see that it goes in the record when I get to Washington.

Senator CLEMENTS. Mr. John Cooper is recognized.

Mr. COOPER. First I want to say, Senator Clements, that I think holding this hearing by the Committee on Public Works has been a distinct public service. I have been so glad to be here and get this information. It seems to me that a great many of these questions that have been asked today will aid in completion of the study by the Corps of Engineers. I notice that Colonel Strong said that their studies are about 70 percent complete. I wonder if it would be appropriate to ask when you think the full studies will be completed, so that the questions being asked can be determined?

Colonel STRONG. I am going to ask Colonel Bidgood, who is in charge of the studies, and who I think can give you a more accurate statement.

Colonel BIDGOOD. I might say, Mr. Cooper, that our intention is that the study on the navigation will be completed in February or March, unless we have more work than we can handle; and in that same regard we have had a series of quite open and free discussion with members of the Green River Valley Citizens League. They have been in the Louisville district office on a number of occasions and we welcome them back again for the purpose of completing this study on navigation alone. On other studies on flood control and construction of reservoirs, certainly we welcome the opinion of anybody in the Green River Valley watershed at any time; they are welcome in our office.

Senator CLEMENTS. John, if they don't complete this study by March on the navigation, I am not only going to be greatly disappointed, they are going to find out that they will have been needled a great deal, because the completion of this navigation study by March is very important if we get the action on it by next year that we need to get.

Colonel STRONG. We are going to keep in such close touch with the district that we will already know about that and we will keep in contact with Washington and with our good friend, Colonel Hiatt here. I don't know whether he would like to make any remarks or not. Do you have any remarks?

Colonel HIATT. I am on the other end of the telephone when Senator Clements takes up this thing he calls needling. It has been most

pleasant to work with the Senator, I assure you, and we will, of course, as Colonel Strong says, make every effort to expedite the navigation program. In connection with Mr. Cooper's question, as to the comprehensive study of Green River, particularly including flood control and major drainage, our sights are not so closely set. I believe there is—I am certain from the questions this afternoon, that there is a need for such a review and comprehensive study of flood control and water drainage aspects of the problem. By major drainage, I mean the channel up to the works which are recommended by the Department of Agriculture. I believe the Corps of Engineers will stand ready to undertake that study when it is requested by the Congress.

Mr. WITHERS. I want to renew my motion to adjourn.

Senator CLEMENTS. I know that we should not keep anyone here any longer than necessary, but I believe it would be well at this point to summarize the proceedings here today.

The representatives from the various Federal and State agencies have given us considerable information which could not have been obtained from any other source.

We have gotten encouragement from their statements, and I am sure that they are convinced of the genuine interest that the people of the Green River Valley have in finding the ultimate solution for these problems. The attendance at this hearing today is definite evidence of that interest.

The final determination of the problems of the valley may not come in one package. When we arrive at these conclusions all of them may not suit any particular individual, including the United States Engineers, members of the Green River Citizens League, or the congressional delegation. We are striving, however, to arrive at a conclusion which will do the most good for the greatest number.

As our studies and surveys proceed on the problems of the valley, I am sure that every group will be given the opportunity to discuss them further with the United States Engineers, United States Department of Agriculture, the United States Department of the Interior, and with the committees of Congress.

Very frankly, as one Member of Congress, I do not suggest for a moment that I know all of the answers, but our meeting today has brought us closer to a common understanding of the varied problems.

On behalf of the Public Works Committee of the Senate, I want to thank you for bearing with us in the presentation of all the details that have been brought out here today. Undoubtedly there will be other problems that will arise after you leave this meeting, and you may wish you had asked the questions that will come to your mind later. I hope you will feel free to write your representatives in Congress as well as those of the Federal agencies here asking them direct the questions which may be on your mind.

If you have any timidity in writing the agencies direct, I would remind you that a Congressman or Senator's office is your means of communication with these agencies.

If all of us put our shoulder to the wheel and give every iota of push to the satisfactory solution of our problems we will be taking a most decisive step in reaching the goals defined here today.

Thank you, friends.

STATEMENT OF GORDON CHASE, REED, KY.

Mr. CHASE. I have lived in the Green River Valley all my life. Floods are becoming more prevalent each year. An all-over flood-control program should be considered.

I would like to say that the raising of pool No. 1, in the lower end of the river, would be very disastrous to the farmers in that end of the river and should not be done.

STATEMENT OF P. M. PERKINS, BOWLING GREEN, KY.

Mr. PERKINS. I own 300 acres in the Green River area, 165 acres of which is low bottom land. I, of course, have a drainage problem, but I am sure that the over-all program is for the best for the entire section; then I am for it. After a complete study of the section has been made, of course this complete study includes the navigation of the stream, the entire drainage problems will be considered, and what electrical benefit of all electrical power that might be generated from the proposed dams, and so forth, and I feel that most of the interested farmers of the valley feel the same way. I am a member of the Green River Valley Citizens League.

Senator CLEMENTS. The record of this hearing will be written and presented by me to the Public Works Committee for the use of the committee and other Members of Congress. The hearing will now recess until further notice.

(Whereupon at 4:05 p. m. the hearing was recessed.)

(Portions of exhibits presented are as follows:)

EXHIBIT FILED BY J. E. WOOD

[Excerpt from Resources for Freedom (Paley report)—Vol. I, Foundations for Growth and Security. A report to the President by the President's Materials Policy Commission, June 1952]

Chapter 1

MATERIALS AND FREEDOM

The question, "Has the United States of America the material means to sustain its civilization?" would never have occurred to the men who brought this Nation into greatness as the twentieth century dawned. But with the twentieth century now half gone by, the question presses, and the honest answers are not glib.

The United States, once criticized as the creator of a crassly materialistic order of things, is today throwing its might into the task of keeping alive the spirit of man and helping beat back from the frontiers of the free world everywhere the threats of force and of a new Dark Age which rise from the Communist nations. In defeating this barbarian violence moral values will count most, but they must be supported by an ample materials base. Indeed, the interdependence of moral and material values has never been so completely demonstrated as today, when all the world has seen the narrowness of its escape from the now dead Nazi tyranny and has yet to know the breadth of which it will escape the live Communist one—both materialistic threats aimed to destroy moral and spiritual man. The use of materials to destroy or to preserve is the very choice over which the world struggle today rages.

This report, Resources for Freedom, has as its central task an examination of the adequacy of materials, chiefly industrial materials, to meet the needs of the free world in the years ahead. Even a casual assessment of these years would show many causes for concern. In area after area the same pattern seems discernible: Soaring demands, shrinking resources, the consequent pressure toward rising real costs, the risk of wartime shortages, the ultimate threat of an arrest or decline in the standard of living we cherish and hope to help others to attain. If such a threat is to be averted, it will not be by inaction. After succes-

sive years of thinking about unemployment, reemployment, full employment, about factory production, inflation and deflation, and hundreds of other matters in the structure of economic life, the United States must now give new and deep considerations to the fundamental upon which all employment, all daily activity, eventually rests: The contents of the earth and its physical environment (p. 1).

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So well have we built our high-output factories, so efficiently have we opened the lines of distribution to our remotest consumers that our sources are weakening under the constantly increasing strain of demand. As a nation, we have always been more interested in sawmills than seedlings. We have put much more engineering thought into the lay-out of factories to cup up metals than into mining processes to produce them. We think about materials resources last, not first.

THE CONVERGING FORCES

Today, throughout the industrial world, but centering inevitably in the heavily industrialized United States, the resulting materials problem bears down with considerable severity. The nature of the problem can perhaps be successfully oversimplified by saying that the consumption of almost all materials is expanding at compound rates and is thus pressing harder and harder against resources which, whatever else they may be doing, are not similarly expanding. This materials problem is thus not the kind of shortage problem, local and transient, which in the past has found its solution in price changes which have brought supply and demand back into balance. The terms of the materials problem we face today are larger and more pervasive.

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THE FUNDAMENTAL CONCEPTS

This report can have significance only as the convictions held by the members of the President's Materials Policy Commission are clearly stated: First, we share the belief of the American people in the principle of growth. Granting that we cannot find any absolute reason for this belief we admit that to our Western minds it seems preferable to any opposite, which to us implies stagnation and decay. Where there may be any unbreakable upper limits to the continuing growth of our economy we do not pretend to know, but it must be part of our task to examine such apparent limits as present themselves (p. 3).

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THE ROAD AHEAD

The size of future materials demand, and the adequacy of supplies, will depend upon the rate at which the United States economy and that of the whole free world expands. If we assume for the moment a favorable set of materials supply conditions, the size of our national output by 1975 will depend mainly upon the size of total population and working force, the number of hours worked per week, the accumulation of capital that has by then occurred, and upon the rise in man-hour productivity. Taking these various factors into account, this Commission believes it is reasonable to anticipate a rate of growth for the United States economy in the future roughly equal to the past rate of growth, or about 3 percent a year. This means that by 1975 total national output (the total of all our goods and services, known as gross national product, or GNP) would be approximately double that of 1950. Estimates of population range between 180 and 220 million; the Commission has assumed, after consultation with the Bureau of the Census, a population of 193 million by 1975 and a working force of 82 million, with a work-a-week perhaps 15 percent shorter than in 1950. These factors imply an annual rise of 2½ percent in production per man-hour against a somewhat smaller past rate of 2.1 percent because it seems reasonable to expect considerably steadier levels of employment and economic activity in the future, in line with the avowed national objective of making major depressions a relic of the past. This does not preclude, however, the possibility of milder fluctuations (pp. 6, 7).

EXHIBIT FILED BY JUDGE W. A. MOORE

[Excerpted from Resources for Freedom (Paley report)—Vol. I. Foundations for Growth and Security. A report to the President by the President's Materials Policy Commission, June 1952]

Chapter 10

SUPPLYING INDUSTRY WITH WATER

Modern industry needs water in vast quantities. It uses water for steam generation, for washing, cooling, and conveying, and as an actual ingredient of manufactured products. Not counting the stream flow used mechanically to generate hydroelectric power, industries in the United States in 1950 used about 120,000,000,000 tons of water—almost 50 times the weight of all other industrial materials. This took a flow of about 80,000,000,000 gallons a day, eight times as much as in 1900. The expectation is that by 1975 industry may require 2½ times as much—200,000,000,000 gallons a day.

Until recently water for industry was taken for granted in most parts of the country except for the arid West. Such complacency can prevail no longer. Water requirements are rising steadily for industrial use and other purposes. In many areas supplies of suitable water are diminishing. The Nation already has a serious industrial water problem and belatedly is coming to recognize it as such. During the Second World War plans for building at least 300 industrial or military establishments had to be abandoned or modified because of inadequate water supply. Many areas of the country are feeling the pinch, either because ground-water reserves are being exhausted or because surface and ground waters are polluted. There can be no question that more will feel the pinch in the next 25 years, and that it will grow sharper. By 1975 access to good water may become the most important factor in deciding where to locate industries (p. 50).

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MEASURING INDUSTRY'S PROBLEM

There is no such thing as a problem of industrial water separate from other water problems. All water comes from the same natural sources; industrial and nonindustrial uses usually are competitive. The size of industry's water problem in the future will depend on the demands of other users as well as on the needs for industrial purposes alone. Nearly always, fundamental solution of an industrial problem, or any other water problem, hinges on development and allocation of total supplies.

For all used in 1950 about 170,000,000,000 gallons per day of fresh water and 15,000,000,000 gallons of salt water were withdrawn in the United States. By 1975, 350,000,000,000 gallons, predominantly fresh water, may be required daily. More than 80 percent of the increase will be for the estimated rise in industrial activity. A study of industrial water problems prepared for the Commission estimated existing and future water requirements as given in table I (pp. 50, 51).

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But even if all these possibilities of more efficient utilization are realized, supplying industrial water in 1975 still will constitute a major problem. Rough estimates of the total use of industrial water in 1950 show that—

About 44 percent was taken by steam-electric generating plants, primarily for condenser cooling. Withdrawals for this purpose are expected to more than triple in 25 years.

About 16 percent by the steel industry which probably will show a slower growth in water use.

About 9 percent for petroleum refining which is expected to increase rapidly.

Five percent for production of wood pulp and paper, expected to increase rapidly (p. 51).

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Not many years ago when water of suitable quality was easy to obtain in most parts of the country costs of collecting and transporting water were usually small. Often it could be drawn from a nearby stream or river. Purification was seldom thought of. So long as supplies were large the amounts of water used were a negligible item in costs of plant operation. Nowadays in

many areas water must be brought from considerable distances, or pumped from deep wells. When nearby supplies are used, extensive purification treatment often is necessary. Water costs are becoming a more important item in industrial production costs.

Precise figures still are lacking on any broad basis, but it has been estimated that, for the Nation as a whole, costs of industrial water may average between 4 and 5 cents per 1,000 gallons. Variations in cost among industries and localities are wide. In Baltimore water for steel making is reclaimed at about 2 cents a 1,000 gallons. Costs of a proposed program reclaiming waste municipal water in Los Angeles to make it fit for irrigation or industrial use have been estimated at between 5 and 10 cents per 1,000 gallons (p. 52).

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WAYS OF INCREASING SUPPLY

There are four general ways of overcoming scarcities of suitable industrial water.

Total usable supply in an area may be increased. This can be done mainly by leveling out supplies throughout the year so that great volumes of destructive floodwater do not rush unused to the sea during some seasons, while in others the stream flow drops below requirements. These wide swings in supply can be reduced by such water-retarding devices as storage reservoirs and vegatative cover on watersheds. Recently interest has grown in increasing supplies of water by artificially induced rain. Ultimately, this could be significant although considerable time would be required for further research on results and development of economically feasible techniques. Purely local shortages may be relieved by piping water from elsewhere; although this usually is a high-cost operation, it already has had considerable application (pp. 53, 54).

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FIVE PRINCIPLES TO FOLLOW

The Commission believes that the following basic principles should be followed in shaping national policies and executing national programs for use of water resources:

Planning and developing water resources must comprehend all aspects of the collection, conservation, and use. The growing needs of industry can be met best if its requirements are treated as one of the major objectives of water policy, in each area and for the whole Nation, together with flood control, navigation, generation of power, land reclamation, and other essential lines of activity. Each major project, whatever its primary function, should be a truly multipurpose installation designed with an eye to present and prospective needs for water for all competing uses.

The varied and complex problems of water can be attacked best by integrated action in each major drainage basin, under a general national policy for use of water resources. This Commission agrees with the President's Water Resources Policy Commission that "Congress should direct the responsible Federal agencies to submit new proposals for water resources development to Congress only in the form of basin programs which deal with entire basins as units and which take into account all relevant purposes in water and land development." In carrying out these proposals, it is most important that adequate consideration be given to industry's needs for water.

Highest economic use must be made of scarce supplies. Most Federal water development projects, except those of the Tennessee Valley Authority, are in the West. Much of that region is arid, and inadequacy of total supplies is a pressing problem. Once provision has been made for household water, the question often arises of whether to use water for irrigation or industry. Irrigation, given high priority in the past, has contributed to the economic development of the Western States, but the need is increasing for weighing the economic justification for irrigation against that of industrial use of the same water, and to compare the alternate public and private costs with public and private benefits for a given outlay.

Benefits must exceed costs. In general, public assistance in making water available is justified only if the benefits are widely dispersed and give promise of being greater than public and private costs. It is difficult to make dollar estimates for some benefits of water development—for example, improve health conditions, and the gains in forestalling long-range tendencies toward soil ero-

sion and deterioration of the water supply. Yet account should be taken of these benefits as well as those to which money values can be ascribed more easily.

Known beneficiaries should help pay for improvements. The identifiable direct beenficiaries should contribute to the costs of public water project in accordance with the benefits they receive. Assume that a Federal project undertaken primarily for flood control provides reservoir storage capacity for municipal and industrial water: Supplies from the reservoirs should be sold to cities and industries at rates that cover the cost. The Commission believes that such payments by users in each region will help bring about maximum gains from water programs (p. 55).

AREAS FOR FEDERAL ACTION

The Federal Government can contribute to improving and increasing water supplies in three main areas: Through research, tighter planning of programs, and cooperation in efforts to control and reduce pollution.

Basis studies and technological research.—Several Federal agencies study such basic components of the water supply as rainfall, runoff, percolation, infiltration, stream flow, ground-water supplies, flood levels, and quality. These studies are of great value to industry as well as to public projects. They should be continued on a scale commensurate with growing requirements for data.

Without sufficient information there will be no adequate basis for judgments on the highest uses of water resources or on the relationship of estimated costs to benefits.

The basic data should be made available to business concerns on a wide scale, and could be particularly useful in helping industries determine where new plants should be located, or in developing new sources of water.

Integration of Federal programs.—Although much responsibility lies with local authorities of the various river basins, national coordination is also necessary.

Federal agencies working on segments of water problems need to make sure that the work of each is consistent with long-range national and regional interests. Duplication of effort, variation in emphasis, and bureaucratic competition among Federal water-resource agencies have resulted in programs that are in some aspects unbalanced and wasteful. Programs that emphasize a single phase of water development can prove costly in the long run by overlooking the other needs and opportunities. The sound development of water resources calls for a multiple-purpose program of each river-basin development along lines that will best promote economic development and best meet the essential needs—both current and potential—of various types of water users in each basin.

This Commission finds merit in the majority recommendation of the Commission on Organization of the Executive Branch of the Government (Hoover Commission), endorsed by the President's Water Resources Policy Commission, for a Federal board of review that can appraise the costs and benefits of proposed Federal development projects from a comprehensive national viewpoint.

Abatment of pollution.—Activities of the Federal Government in holding down water pollution, although secondary to local efforts, have become increasingly important. Even more important, industry has begun to see the need for pollution control in its own interest as well as for public welfare.

This Commission is convinced that industrial pollution can be significantly reduced only by the cooperation of industry and Government; it also believes that, to the greatest practicable extent, private sources of pollution should be eliminated at private expense. Industry already has made a beginning (pp. 55, 56).

[Excerpted from Resources for Freedom (Paley report)—Vol. V, Selected Reports to the Commission. A report to the President by the President's Materials Policy Commission, June 1952]

Report 9

WATER FOR UNITED STATES INDUSTRY

With the exception of the air he breathes, water is the most essential single material which man uses. Indispensable in directly sustaining all plant and animal life, it is hardly less important in its other myriad uses. Water is the master solvent and cleanser, and the most efficient medium for transfer of heat and energy, both solar and man-controlled. It is the vehicle which affords the cheapest transport of heavy and massive produce and the disposition and dilution of most man-made wastes.

Water is readily available for use as a vapor, a liquid, or a solid. Its diverse and unique physical properties are constantly being exploited to add to man's comfort and well-being. Water was one of the first natural resources which man harnessed for use; the ancient Egyptians were using water from the Nile River for irrigating land at least 5,000 years ago. Today water remains a universal requirement for our material needs and a keystone to our long-range security (p. 83).

Our investment in water

In most places the cost of water is essentially the cost of collecting, purifying, and transporting to the consumer; nevertheless, in many arid water-short sections of the Nation, the meager water resources are the most prized assets. The average city dweller pays only about $6 per capita for water delivered into his home for an entire year. The comparable rural inhabitant, usually being supplied through an individual water system, must pay indirectly a much higher rate. Although pure water is commonly delivered into American homes at less than 5 cents per ton, the aggregate water bill for the Nation, including water for irrigation, industry, and domestic purposes, is of the order of $3 billion annually. This figure is for water supply only and does not include cost of treatment and disposition of waste water or expenditures for hydroelectric power, flood control, or drainage.

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Use of water

Just as our large metropolitan areas must import milk or meat from vast rural production areas, so must they import water from less heavily populated districts. The problems involved in such transport are of great magnitude; the costs are tremendous; rural satellite areas may be deprived of water; conflicts may arise with industrial and agricultural water users. Nevertheless, such projects are well within the financial capacity of single large cities or groups of smaller neighboring cities. In a great many cities, officials have found it convenient for the high-revenue-producing water department to support the fire department, the police department, or other offices.

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Industrial location based on water supply

Water supply has always had a significant effect on industrial location, but until recently most of this influence was exerted in an indirect manner. By 1975 water supply may be the most important factor affecting industrial location.

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The Nation was extremely fortunate during the Second World War that the water supply was above average. If a major drought, similar to the one experienced in the 1930's, were superimposed upon a war period when peak industrial and agricultural production was essential, the results could be disastrous. The elimination of this threat will require stepped-up surveys of water resources and coordinated selection of industrial sites by industry and Government (pp. 86, 87).

GOVERNMENT AND WATER MANAGEMENT

The timing of water development is important for many reasons. The mightiest dams cannot permanently solve the Nation's water problems. Concrete deteriorates and reservoirs eventually fill with sediment. The life of a reservoir may range from only a decade to several centuries. There has been no successful method devised to halt deposition of sediment or to remove it economically, and none is in sight. With competent study, reservoirs can more than repay their cost during their lifetime, but that is not the real long-range problem. Dam sites are scarce, and when all available reservoirs are filled with sediment storage and control of water will be practically impossible (p. 91).

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Trends in water demand

The total withdrawal of water in the United States since 1900 has doubled on the average about every 25 years. Though the rate of population growth during the next 25 years will likely decrease, it is believed that the constantly rising standard of living and the increasing per capita consumption of raw materials may require that the Nation's water supply be doubled again from 1950 to 1975.

This would result in a total withdrawal about equal to the estimated maximum supply available for development under present conditions.

As our existing supplies of high-grade materials are further exploited, more effort will be directed toward developing synthetics and marginal ores. There is every reason to expect that these new processes will accelerate the presently increasing requirement for water. The great use of high-quality water in the chemical, rayon, and synthetic-rubber industries can give us an excellent preview of future industrial water needs.

About one-half of present industrial water demand is for production of energy, and already we can visualize greatly increased requirements for new methods of producing energy—liquefying coal and shale and development of nuclear energy. By 1975 probably 65 percent of industrial water and 40 percent of total water withdrawals may be required to produce needed energy. This, of course, does not include the tremendous quantities of water that may be needed in the stream to generate hydroelectricity (p. 93).

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REGULATION OF STREAMS

The principal reason for building dams and reservoirs is to regulate or equalize the flow of streams. To spread excess water throughout the dry seasons, and perhaps even several dry years, requires an integrated system of man-made reservoirs to store and release water as it is needed. It is estimated that about 170 million acre-feet of reservoir storage have been developed in the United States, enough to store 13 percent of the average annual runoff. Not all of this storage space is available for conserving water for withdrawal. Nearly one-fifth (19 percent) must be kept empty in readiness for intercepting floodwater and gradually releasing it so that the downstream channels will not overflow and damage adjacent property. Other important purposes served by reservoir storage are navigation (12 percent) and power generation (39 percent), which require uniform flow throughout the year. Recreational uses account for 2 percent. Only about 28 percent of this man-made storage is allocated for withdrawal to meet the needs for irrigation (22 percent), and for industrial and municipal use (6 percent).

A much higher proportion of the runoff in the West is regulated by dams than in the East, where natural flows are more uniform. Complete control of our streams would require several times as much storage space as is now available. This additional storage would cost much more per unit of volume than does the existing storage. For example, the active storage space created on the Colorado River by the Hoover Dam costs about $6 per acre-foot, but the comparable storage behind 10 dams now proposed for the upper Colorado by the Bureau of Reclamation would cost $30 per acre-foot. It probably will never become economical fully to control the Nation's streams. At any rate, it will not be economical or possible to do so within the next quarter century.

Further regulation of streams will likely provide a large portion of expanded water needs in the next 25 years, but such regulation cannot fully or permanently solve our water problems. It will not be practical to build storage dams on the lower Mississippi and many other streams. Sedimentation will become an increasingly serious problem, as will evaporation from reservoirs. It is estimated that each year the reservoir capacity of the United States is markedly reduced because of deposited sediment. It is also estimated that several million acre-feet of stored water are evaporated. The high rate of evaporation in some areas may eventually cause some reservoirs to lose more water than is conserved as deep storage becomes filled with sediment (p. 95).

OVER-ALL GREEN RIVER WATERSHED PROGRAM IN DETAIL

> "The waters of Kentucky are as necessary for our existence as the air we breathe, yet they are one of our most abused and neglected resources. The future progress and development of the commonwealth depends on the protection, conservation, and wise use of our water resources."—O. W. CHINN.

The public notice on the front cover briefly outlines the above program. In addition a print of Bob Rowe's drawings on the inside of this folder is a masterful and artistic conception of the over-all project. Credit for same must go to the Kentucky Division of Flood Control and Water Usage, Department on Conserva-

tion, Frankfort, Ky., of which division O. W. Chinn is director and S. A. Wakefield assistant director. Both of these gentlemen have been of inestimable help to the Green River Valley Citizens League, Inc., in its efforts.

RUNOFF AND WATER-FLOW RETARDATION AND SOIL-EROSION PREVENTION

This part of the over-all program is effectively described in the United States Department of Agriculture House Document No. 261, Eighty-second Congress, first session, entitled "Green River Watershed in Kentucky and Tennessee." Congressman Watts introduced House bill, H. R. 6473, Eighty-second Congress, second session, to cover as did Senators Clements and Underwood, Senate bill, S. 2616.

On July 5, 1952, Secretary of Agriculture Brannan provided probably the best and briefest description that the plan is needed to "contain floodwaters at their sources" and "designed to stop floods before they begin."

Congressman Golden said in the House on June 24, 1952: "Already in Kentucky there has been a complete feasible comprehensive survey and report embodying all of these programs for the watershed of the Green River in Kentucky." He was speaking on his bill for similar programs in the watersheds of the Cumberland and Kentucky Rivers.

Without intending too much to detail we quote:

DEPARTMENT OF AGRICULTURE, OFFICE OF THE SECRETARY,
Washington, October 19, 1951.

The SPEAKER, HOUSE OF REPRESENTATIVES.

DEAR MR. SPEAKER: I am transmitting herewith a survey report dated May 1950, together with accompanying letters and appendixes, on the Green River watershed, Kentucky and Tennessee, as authorized and directed by section 3 of the Flood Control Act approved on August 28, 1937.

It is recommended that the program as set forth in the report be authorized for installation in the watershed.

The Bureau of the Budget advises that it has no objection to the submission of a report proposing the installation of the following practices and measures (table 2, p. 16, of the Green River Flood Control Survey Report) under the authority of the Flood Control Act of 1936, as amended:

1. Subwatershed waterways.
2. Gully stabilization and sediment control.
3. Road and railroad bank stabilization.
4. Channel improvement and stream bank stabilization.

The Bureau of the Budget also advises that it is in aggreement with the objective contemplated in the report, of the acceleration of land-treatment measures designed to retard floods and to prevent soil erosion, and that this objective is particularly desirable from the point of view of coordination of upstream measures with programs of the Bureau of Reclamation and the Corps of Engineers, under their respective authorities.

Sincerely,

CHARLES F. BRANNAN, *Secretary.*

Artist Rowe depicts many aspects in his herein drawing while a map, also herein, of Green River minor watersheds will answer many questions even as to the priority order of operations.

FLOOD CONTROL-WATER STORAGE

This involves the United States Army Corps of Engineers flood control-water storage as referred to in Committee Document No. 1, Seventy-fifth Congress, first session, entitled "Comprehensive Flood Control Plan for Ohio and Lower Mississippi Rivers," and as further covered in so-called Flood Control Act approved on June 28, 1938, and known as Public Law No. 761, Seventy-fifth Congress. Also House Document 535, Seventy-eighth Congress, second session, entitled "Rough River and Tributaries, Kentucky," and Flood Control Act of 1944, known as Public Law No. 534, Seventy-eighth Congress, second session, approved December 22, 1944.

In its brochure entitled "Green River, Ky." issued early this year by the Kentucky Division of Flood Control and Water Usage, we find:

"*Flood-control projects.*—By the Flood Control Act of June 28, 1938, a series of flood-control dams and channel improvements, coupled with improved land-use practices, was designed to control floodwaters in the Green River Basin. These

projects are No. 2 Green, Nolin, Rough, No. 2 Barren, Mining City Reservoir, and channel improvements on Rough River and Barnett Creek."

No. 2 Green Reservoir project.—The authority for this flood-control reservoir is the Flood Control Act of June 28, 1938. The dam site is situated at 259.1 miles above the mouth of Green River and is a mass concrete type of dam. It has a length of 1,630 feet and a height of 92 feet. The spillway is uncontrolled with a length of 1,200 feet and a height of 82 feet. The drainage storage area of the reservoir is 707 square miles and has a flood-control storage of 252,000 acre-feet. The maximum flow of record at the dam site was 25,100 cubic feet per second on December 31, 1942, but the reservoir is designed to handle a flood-peak flow of 95,500 cubic feet per second, a factor of safety of over 3. The total estimated costs will amount to $6,200,000; $1,470,000 of which will be the result of buying up lands and damages and $4,730,000 for preliminary work and construction. No part of the project has been started yet.

Nolin Reservoir project.—The dam site is located in the Nolin River in Edmonson County about 9 miles above the mouth of the river. The dam is an earth-fill nonspillway section 960 feet long and 154 feet above the stream bed. The spillway is a mass concrete section 350 feet long and 134 feet above the stream bed. The drainage area above the dam is 688 square miles with a maximum flow of record at dam site of an estimated 44,300 cubic feet per second, occurring in January 1937. The spillway is designed to handle a maximum flow of 93,300 cubic feet per second. The capacity of the reservoir is 474,000 acre-feet, 464,000 acre-feet of which is used for flood control. The area submerged would amount to 12,000 acres. The total cost of the dam is estimated at $11,100,000. Lands and damages would amount to $2,300,000 and preliminary work and construction would cost $8,800,000. Construction work has not been started and no allotments have been made to date.

No. 2 Barren Reservoir project.—The dam is a combination earth and concrete dam with a total length of 3,860 feet and maximum height of 142 feet. It is located 10 miles northeast of Scottsville, Ky., and 79.2 miles above the mouth of Barren River. The spillway is uncontrolled and a mass concrete type that is 200 feet long and designed to handle a flood-peak flow of 86,400 cubic feet per second. The reservoir has a drainage area of 941 square miles and a total capacity of 502,000 acre-feet, 479,000 acre-feet of which are used for flood control. At maximum elevation the reservoir has backwater for 41 miles. The total estimated cost is $17,775,000. The cost of lands and drainages amounts to $5,900,000, while preliminary work and construction costs amount to $11,875,000, $25,000 of which have been allotted for new work up to June 30, 1950. Construction work has not been started as yet.

Mining City Reservoir project.—The reservoir will be in Muhlenberg, Ohio, Butler, Warren, and Edmonson Counties, Ky., and will be located 103.8 miles above the mouth of the Green River and 10 miles east of Central City, Ky. The dam itself is a concrete gravity and earth embankment type with a total length of 9,200 feet and a maximum height of 132 feet. The spillway is an Ogee section in the concrete dam controlled by slide gates and designed to handle with safety the maximum flow of record of 214,000 cubic feet per second recorded in 1937. A navigation lock would be installed on the left bank of the stream with a lock chamber of 56 feet wide and 360 feet long, capable of handling modern barges. The reservoir has a drainage area of 6,189 square miles and necessitates the relocation of 6.2 miles of railroad and 66 miles of highways and other utilities. The total capacity of the pool is 3,795,000 acre-feet. The total area inundated is 143,700 acres and the reservoir has a backwater of 116 miles in length. The total estimated cost is $55,700,000. Preliminary work and construction amounts to $19,800,000 with lands and damages of $35,900,000. Costs to June 30, 1950, have amounted to $345,326.69 with the net allotments for new work on the project being $409,000 up to June 30, 1950. There has been no further progress on the project and construction has not been started.

Rough River Reservoir project.—The dam would be located on Rough River 89.3 miles above the mouth and 6 miles upstream from falls of Rough, Ky. The length of the dam is 1,530 feet with a maximum height of 124 feet. The type of dam is earth- and rock-fill embankment with a top width of 30 feet and a bottom width of 788 feet. Water outlet is through an uncontrolled spillway through the left abutment with a discharge of 56,200 cubic feet per second as compared to the maximum flow of record of 30,000 cubic feet per second recorded in January 1937. The reservoir has a design flood peak flow of 43,000 cubic feet per second and has a drainage area of 449 square miles. The top flood-control pool has a backwater of 45 miles and inundates a total of 9,940 acres. The total

capacity of the reservoir is 312,700 acre-feet of water, necessitating the relocation of 4.8 miles of highways, 2.5 miles of electric lines, and 2 miles of telephone lines. The conservation pool consisting of 12,000 acre-feet and the flood-control pool holding 300,700 acre-feet. The total cost of the project is estimated at $6,570,000. Lands and damages consisting of $1,050,000 and preliminary work and construction amounting to $5,520,000. The cost to June 30, 1950, has been $48,842 with the net allotment to the same date being $48,841.29. Construction work has not been started as yet.

Flood-protection project: Rough River channel improvement.—The channel improvement is located on the Rough River and extends from the mouth of the river to the mouth of Caney Creek in Ohio County, a distance of some 64 miles. The improvements will consist of channel cleaning and removal of snags and silt bars. The estimated total cost of construction will amount to $623,000, $3,000 of which is the estimated costs of land and damages. There have been no appropriations as of June 30, 1950, and construction work has not been started. This project was authorized by the Flood Control Act of 1944.

Flood-protection project: Barnett Creek channel improvement.—The project consists of a channel rectification on Barnett Creek extending from its mouth to mile 6.7 and on North Fork, a tributary entering Barnett Creek at mile 6.15, a distance of 2.3 miles, a total of 9 miles of improvement. Channel rectification consists of excavating a new trapezoidal section in a direct channel to Rough River. The estimated total cost of construction is $92,000. Lands and damages consist of $13,000 and the construction cost amounts to $79,000. There have been no appropriations as of June 30, 1950, and construction has not been started as of that date.

On the subject of flood damages we again quote from the aforesaid Kentucky Division of Flood Control and Water Usage brochure:

"*Flood damages.*—The Green River is subject to severe floods which are becoming more regular every year, and usually occur in the early spring. The most severe flood of record in the Ohio River Basin and also in the Green River watershed was that of 1937, occurring in January of that year.

"An example of the annual damage caused by floods in the Green River are given in the following data:

Average annual floodwater damage

Agricultural	$4,788,000
Public roads and railroads	386,000
Subtotal	5,174,000
Sediment damage; added water treatment costs	183,000
Total annual average damages	5,357,000

"A part of flood damages not able to be computed accurately is that of land being damaged by erosion. As of the present day, there are 2,530,000 acres now classed as critical (deteriorating) flood-producing runoff areas. This acreage is increasing yearly and future flood damages will grow proportionally unless flood-control measures are taken."

Furthermore, this folder contains news items on the March 1952 flood which came very near to devastating the Bowling Green area as indicated. Here alone is a single powerful argument for the early construction of dams in the far upper reaches. Mammoth Cave was likewise threatened.

Unfortunately the people of the Green River Valley and others engaged in fierce debate starting in the late thirties for and against the above-described Mining City Reservoir project. Incidentally, it is misnamed because originally it was planned for location at Mining City but later moved downstream below instead of above Rochester. After many months of efforts the Green Valley Citizens League, Inc., succeeded last April in composing the opposing views by resolving in favor of the immediate construction of the dams in the far upper reaches and waiting to observe their effectiveness before considering the Mining City project. This action is recorded elsewhere herein in great detail. It makes possible immediate appropriations by the Congress.

If the Mining City controversy could have been avoided it is safe to say that today the Green River Valley would have in operation a number of these badly needed flood-control water-storage dams. And, it is also safe to say that our valley would now be the scene of much of the industrial expansion and activity now going on in the Tennessee Valley, for it cannot be successfully denied that

steam-electric power can be made in the Green River Valley at far lower cost than in the Tennessee Valley or anywhere else in the world, by reason of the huge coal deposits adjoining the water. Cheap electricity coupled with ample and continuous water flow are the magnets drawing industry, including the atomic plants, to the Tennessee Valley.

Also herein is a news item on the recent near water-flow failure at the Kentucky Utilities Co. Green River generating station. If anything, it proves that something must be done to firm up our water flow. Without its high dams, the Tennessee River during the current drought would have been in far worse shape for water flow than Green River. In the face of these facts we inquire: Must the Tennessee and Cumberland Valleys receive all the money? Are not the Green, the Licking, the Kentucky, and the Big Sandy also entitled to some consideration?

The lack of continuous water flow in the Green River Valley undoubtedly operated against our valley being selected for the atomic plant recently awarded to southern Ohio. While Green River has a far better water flow than the Scioto River in Ohio, the fact remains that the steam-electric power had to be made on the Ohio River because of the huge water requirements. Yet, the needed power could be made far cheaper in our valley if only we had the flood control water-storage dams. Thus, we should all comprehend how costly the Mining City controversy has been to the Green River Valley to date. However, more and more expansion seems ahead for which we should prepare with all vigor. In fact the national defense demands such action.

It does not appear that the operation of the proposed flood-control dams should be cluttered with the making of hydroelectric power because that would undoubtedly conflict with effective flood control and water storage to say nothing of increasing cost and delaying construction. In any event steam power can be made more cheaply and does not need firming up as has been found so essential, as to hydropower on a large scale in the Tennessee Valley and elsewhere. The same will prove true in the Cumberland.

Again we refer you to Artist Rowe's drawing herein as to these dams and reservoirs.

DRAINAGE AND NAVIGATION

We refer to the United States Army Corps of Engineers navigation project as per resolution by Committee on Public Works of the United States Senate, April 15, 1949, referring to the report as published by the Committee on Rivers and Harbors, Document No. 2, Seventy-first Congress, first session, entitled "Green and Barren Rivers, Ky.," and other reports including, more importantly, House Document No. 81, Seventy-third Congress, first session, entitled "Green, Barren, and Rough Rivers, Ky."

The latter document includes the March 26, 1931, plan of the Louisville district engineer which, if carried out, would have made the Green River Valley "the dream of dreams." It provided the answers to navigation, flood control, water storage, and drainage. The people of our valley in their somnolence allowed the plan to be printed and filed by the House on June 10, 1933, at a time when worthy public-works projects were being eagerly sought. Selfish opposing interests had their way; yet even they would be profiting heavily today from a valley that would present a far different economic status if only the plan had been enacted. Instead, seemingly, we lay awaiting the chance to expend energy on the Mining City controversy which if applied to the 1931 plan would have wrought wonders in freeing us from economic slavery.

As to drainage, we sorely need adjustable dams to flush out the river which is fast filling up. Then, too, the very bad drainage situation in the Panther Creek Valley of Daviess County might be corrected or, at least, considered in connection with the proposed navigation improvements. Why should not Mud River empty below, instead of above, the Rochester Dam and thusly afford improved drainage in the Mud River Valley? And why should not Little Muddy Creek be made to flow through the Back Swamp Branch below instead of above Woodbury Dam? The wonder is that the farmers have not requested these very simple improvements sooner while millions have been spent elsewhere including foreign countries. The drainage in the Rough River Valley is pitiful.

Modern navigation is needed so the products of the valley may be delivered at the lowest possible cost by river transportation in competition with products so transported from other areas. If we are to have coal-oil synthetic liquid fuel, aluminum, carbide, and similar industrial plants it is essential to ship and

receive in large barges and tows the same as on the Ohio, Mississippi, Tennessee, Cumberland, Illinois, and other inland rivers.

Our present locks and dams are pathetically small and out of condition. Green River locks and dams Nos. 1, 2, 3, 4, and Rough River No. 1 all need modernization which can be accomplished at a surprisingly low cost. Green River lock and dam No. 5 and Barren River No. 1 were modernized in 1933–34 for the natural rock asphalt trade in anticipation of the aforesaid 1931 plan being enacted. Without the latter the asphalt tonnage disappeared from the river because modern barges are too large to penetrate through to the Ohio River. Thusly, we have an unusual situation where upstream we have locks 56 by 350 feet, while downstream the largest is only 36 by 141 feet. On the Ohio these are 110 by 600 feet, large enough to accommodate tows with one lockage. On the Mississippi some building are 1,200 feet long. How can we complete under such handicaps?

Another thing, the Illinois and Ohio Rivers are moving toward 12-foot instead of 9-foot draft. No doubt this could be had on the Green with minor changes in planning. Otherwise, in a few years we will be hopelessly obsolete.

We are so bold as to predict that unless Green River navigation is modernized it will be impossible to properly "coal," at the lowest cost, the power plants furnishing electricity to the Paducah, Ky., and Piketon, Ohio, atomic plants. Under stressed conditions the railroads cannot haul the added load. Again we say that national defense commands action.

Maintenance in the Green, Barren, and Rough Rivers is almost nil and is best described in the following appearing in the Waterways Journal, August 1, 1952:

"Charles B. Vinson, of Beaver Dam, writes: 'That fine picture of the snagboat *Mammoth Cave* in the May 24 issue made me wish for such a boat on Green River now. I recently made a trip on my *Dixieland* from Spottsville to Cromwell. I would have needed an adding machine to record the number of cave-ins, even big trees standing in the middle of the river. The boys at Washington have surely forgotten our once beautiful Green River. Best regards to all.'"

Elsewhere herein it is stated these rivers are filling up and a picture of the Rumsey Dam seems eloquent.

TOTAL COST AND PAYING FOR OVER-ALL PLAN

It certainly appears that the total initial cost would not exceed $55,000,000, which is a mighty small sum to do so much good both nationally and locally.

Our opponents bellyache that it is a waste of the taxpayers' money to carry out this program. This is the same as saying that the Panama Canal should not have been built. That has been paid for many times by tolls collected. The same is possible in our valley whether it be by tolls or savings. This writer favors tolls if applied everywhere which is logical and financially sound. If applied, the national debt could be reduced progressively.

[From the Green River Republican, Morgantown, Ky.]

VALLEY IS IN AGREEMENT ON DEVELOPMENT OF INDUSTRY, FLOOD CONTROL, NAVIGATION

"There's confusion and no agreement among the people down there." That invariably has been the response of Kentucky congressional leaders to the Green River Valley Citizens League, Inc., in its efforts to obtain badly needed flood control and navigation improvements. This has been substantially true, but it is not so any longer because the league's efforts are bearing fruit.

The almost violent disagreement over the proposed Mining City high dam about midway in the valley has been superseded by agreement late last month that the four or five dams in far upper reaches of the valley should be built first to determine whether same will bring the desired results of flood control and water storage. This program is quite likely to succeed if along with it there is enactment and implementation of the Watts bill providing for local control of water runoffs on the farms. This is league-supported and involves real soil conservation and has strong backing among the farmers. The four or five upper dams were among several more first proposed back in 1931 by the Louisville district engineer, and had the valley demanded same at that time it is certain that far better farming and economic conditions would prevail today.

In the meantime tons of topsoil are gone forever and industrial development has gone to the Tennessee Valley instead of the Green River Valley where the lowest cost coal-steam generated electric power can be made.

Strangely that 1931 report proposed larger locks at Spottsville, Rumsey, Rochester, and Woodbury on Green River to accommodate Ohio River barges which are too large to pass through the presently small locks. So, again, if the 1931 plan had been executed we'd now be witnessing some modernized navigation on a large scale. Some sharp disagreement arose in recent months when it was proposed to reduce construction and operating costs by raising the Spottsville Dam 14 feet and eliminating the Rumsey lock and dam. But the opposition in the lower valley is of such potency that no doubt the Louisville district engineer will find it wise to recommend the 1931 plan rather than risk further delay which project must include adjustable dams for flushing out the river so urgently necessary.

Thusly, the league leaders feel that progress is being made in coordinating and composing plans and efforts for valley development that will free its people from so-called economic slavery.

[From the McLean County News, Calhoun, Ky., May 1, 1952]

FOUR FLOOD CONTROL DAMS PROPOSED

Construction of four flood-control dams in upper Green River Valley and cleaning out of the river channel were endorsed at a meeting in Livermore Friday night.

Called by the Green River Valley Citizens League, the meeting was attended by 75 persons representing 18 cities in 9 counties in the valley. Present were several directors of the league and directors of the Green River Agricultural and Drainage Association.

There was no opposition expressed to either the four-dam proposal or the cleaning of the river. However, it was evident that the proposal to clean out the channel drew the most enthusiasm. An engineer from the district engineer's office said last winter at Calhoun that there was no silting in Green River and the slip-ins were not serious. However, it appears that the opinion in the valley is unanimous that the river is choked with debris which causes more severe flooding and interferes with drainage.

The four dams proposed are on Nolin River, Rough River, Barren River, and on Green River above Mammoth Cave.

Previous suggestions for flood-control projects on Green River have met with opposition from those in the area that might be flooded behind the dams. However, the dams proposed would permanently flood relatively little land, and are located where the lakes would be narrow and land less valuable. It is believed that opposition from the dam areas would be less than on such proposals as the Mining City Dam.

The four dams suggested have already been planned and authorized by Congress, but no money has been appropriated for them.

Several of the farmers present spoke in favor of measures for flood control, pointing out that the floods are getting more frequent, higher and longer each year. Harry W. Gatton added another important point. He said that frequent flooding has caused farmers to give up wheat and clover and plant only soyb ans. And wheat and clover which used to fight the cockleburrs cannot be grown now. Therefore, if something is not done about flood control we may be conquered by the lowly cockleburr.

McLean County was represented by about 25 persons, from Livermore. Island Calhoun, and Beech Grove.

[From McLean County News, Calhoun, Ky., May 3, 1952]

LET'S PUT GREEN RIVER TO WORK FOR US

Another milestone in the growth of western Kentucky is the announcement that a $10 million carbide plant will soon be built at Calvert City, near Kentucky Dam. This is the largest of several that have located in that area since the completion of Kentucky Dam. They include the gian Pennsylvania Salt Co. plant, Pittsburgh Metallurgical, and other smaller ones, not to mention the Paducah atomic material plant.

The carbide plant will no doubt draw to the area other related industries. With electric power and water transportation available, plus many mineral resources, the spot is a natural for industrial development. As the Paducah press aptly said, "this may become one of the largest and most significant industrial communities in Kentucky."

In many ways the Green River Valley is just as ripe for development as was the Tennessee a few years ago. In the Kentucky utilities plant at Green River we already have the electric power from coal. We have iron ore as good as that Hitler used to build his war machine that nearly whipped us. We have coal and oil, and gas is available. The one main item we still lack is adequate water transportation. With the construction of a new lock and dam at Spottsville we could have that.

Once the Green River was a great artery of commerce. Railroads and highways ended that era. Since then it has been a plague flooding us with increasing frequency. The time has come now that we can put the river to work for us again.

Let's get at it.

[From McLean County News, Calhoun, Ky., November 1, 1951]

LONG-RANGE FLOOD-CONTROL PROGRAM IS BEFORE PUBLIC WORKS COMMITTEE

"A long-range flood control and conservation plan for the Green River Valley is now before the Senate Public Works Committee.

"If adopted and completed, the plan would practically remove the threat of backwater and floods in McLean County. As such its value to this county would be beyond measure.

"The report of this plan was prepared by the Department of Agriculture and released some time ago, and reported in the McLean County News at that time. It has already been approved by the Bureau of the Budget. What the Senate will do with it is, of course, anybody's guess."

(It is important to remember that this program is not the same as the plan to raise the Spottsville Dam. It is not the same as the plan to control floods with the Mining City Dam. It is much broader than either of these.)

"The plan includes a 20-year program of improvement in the Green River Basin. It does not depend on one or a few large dams alone for its flood-control features. Rather it includes a very broad program to catch the water where it falls, use it as much as possible, and slow its travel to the river's mouth.

"Principal measures planned are:

"Subwatershed waterways, farm waterways, terraces and field diversions, gully stability and sediment control, erosion control along roads and railroads, perennial vegetation, pasture development, farm ponds, wildlife area development, forest plantings, land acquisition, management of flood-control lands, tributary channel improvement, and stream-bank stabilization, and other soil and water conservation practices.

"This program would include Barren, Rough, Nolin, and Little Barren Rivers, and Panther and Russell Creeks.

"Floodwater and sediment damage in the area cause an estimated annual loss of $5,357,000, principally due to the flooding of agricultural crops."

TOTAL COST OVER 86 MILLION

"Total cost of the flood and conservation program is estimated at $86,601,000, based on 1948 costs. The total would be considerably higher now.

"Of this cost, the Federal Government would furnish $56,305,000, non-Federal public agencies $1,270,000, and private interests $29,025,000.

"However, the contribution of private interests—farmers and others—would not be entirely in cash. The report specifies that their contributions may include labor, materials, equipment, land easements, rights-of-way, and other assistance.

"The Department of Agriculture estimated the improvement program would cost $20,979,000 annually for operation and maintenance once it is completed. This would include $303,000 in Federal funds and $20,586,000 or 'its equivalent' in local payments by private interests."

BENEFITS SET AT 53 MILLION

"The program would yield average annual benefits of $53,355,000, the report estimated. Flood-control benefits were estimated at $1,510,000 and associated benefits at $51,845,000.

"Because only about 3 percent of the benefits could be assigned to flood control, the Bureau of the Budget said that little new authorization would be needed to put the program into effect.

"It is possible," the Bureau said, "that the entire recommended program might conceivably be undertaken without additional authorization."

[From Ohio County News, Hartford, Ky., June 20, 1952]

GREEN RIVER VALLEY CONTAINS EVERYTHING KENTUCKY COULD DESIRE FOR ITS RESOURCES

(By A. P. Harding, executive vice president, Green River Valley Citizens League)

If Kentucky proceeded to the "wishing well" in the hope that by some magic its wish would be granted for an area with all the resources necessary to meet the most pressing needs of our times that wish would encompass a vale with only a small part of the tremendous gifts from God that are those of the Green River Valley. A people would not dare to ask for all the things we now possess.

That being true, why does youth flee from the valley as it has for decades, after being born, reared, educated, and trained here? Is it that we glory in forming these armies of humans for places like Louisville and Chicago and Detroit? Not at all. Then what is the missing link? Development is the answer: Nothing more than a realization by the valley citizenry that God conferred the resources for man to fashion to his needs. There has been no fashioning, so to speak, "as any fool can plainly see," to quote Li'l Abner.

However, here again, a trip to the "wishing well" could not, in the fondest of dreams, result in a plan equal or superior to that prepared by Louisville district engineers under date of March 26, 1931, as printed in House Document No. 81 of the Seventy-third Congress, first session, where it was ordered printed June 10, 1933.

This dream of dreams provided for modern navigation from stem to stern in the valley at a very minor cost of only $4,854,900. Just as important, if not more so, were six flood-control water-storage dams in the far upper reaches of the valley, at the cost of $15,093,000. The plan discussed many other vital things, only "to waste its freshness on the desert air" created by the somnolent humans of the valley. True it is that this was at a time when the Nation floun'ered in the convulsions of a world-shaking depression, but there followed an area, continuing this day, of Federal spending the likes of which can never again be repeated. And what for? For some projects far less worthy and necessary than the ones in our valley.

Why "far less worthy and necessary"? Because, for example, can anyone imagine the Federal Government building of numerous steam power plants in the Tennessee Valley if the Green River Valley had the water storage provided for in the 1931 report? Surely those plants are not located where the lowest costs can be attaine', because without question that is in the Green River Valley.

Nor would the Atomic Energy Commission today be insisting on an Ohio River location if—only if—in 1933 we had as little as 1 percent of today's energy behind the Green River Valley Citizens' League, Inc.

HOW INDUSTRY AND AGRICULTURE CAN BENEFIT FROM FLOOD-CONTROL DAMS

Exactly how can agriculture and industry benefit from the four proposed flood-control water-storage dams in the far upper reaches of the Green River Valley already authorized and awaiting funds by Congress?

This question arises from the Green River Valley Citizens' League, Inc., news notes of last week, reporting the threatening debacle at the Green River generating station of Kentucky Utilities caused by the drought, hot weather, and the badly leaking Rumsey Dam. (On August 7 the situation is somewhat improved, due to hand patching of the dam and rains bringing about normal pool and a lower water temperature of 90°. The Louisville district engineers assures

us of "a thorough backing of the dam will be accomplished later on this fall when floating plant is sent to Green River for channel work.")

Some recall league news notes of last April on the almost continuously high water in the lower part of the valley starting in November of 1951. Unharvested crops were lost, as happens too often to the farmers affected, along with other damages that might well be averted if only man will fashion the God-given gifts as inten'ed. Little or no fashioning has taken place in our valley, largely because its citizenry has not up to this time taken the needed steps.

Here, then, in this calendar year we have concrete instances of industry being threatened by low water and agriculture by high water. Returning to our basic question, the supplemental one is suggested as to how the two extremes of low and high water can be mastered without confliction between the best interests of farming and industry. Seemingly the divine plan answered that one also, if only we will do a little fashioning.

But let us first examine into the low-water problem. Fortunately, Uncle Sam's Water Resources Division of the Department of the Interior Geological Survey collects and records data daily on water flow over the years. The record low flow, equal to about 181 million gallons daily, was recorded at Livermore for 8 days during October 1930. October also proves to be the month of record low flow averaging about the same daily gallonage for the 18-year period ending with 1948. The KU Green River generating station now uses 72 million gallons per day, some of which is evaporated and not returned directly to the river. About this time next year when the plant is doubled it is obvious that nearly 150 million gallons daily will be needed. Not only that but with hot weather and a leaking dam it is easy to heat the water unduly when there is little or no flow all of which defeats the cooling and condensing operations at the plant. These rather tiresome details should emphasize the existing "close fit" which would be worsened if KU increased the plant beyond the present doubling expansion. And, if we want that further increase instead of letting it go to the Ohio River something must be done by us. Mind you, the Tennessee River was once in our shape and flood-control storage dams have worked wonders for it, not in hydroelectric generation but in constant water availability for steam-electric generation.

Our valley yearns for coal-oil synthetic liquid fuel plants for which the water requirements are tremendous. For example, a 10,000-barrel-a-day unit is said to require from 9 to 13 million gallons daily, so a 30,000-barrel-a-day plant would call for 27 to 39 million gallons daily. And several plants would increase the needs still more. But water is reused after cooling between plants spaced along the river; therefore, one must not assume that all of the water is used once. Nor is it a matter of simple addition and subtraction. However, there must be a constant flow of freshening water. In any event, it is clear that the low flow of around 181 million gallons daily must be increased.

This is comparatively easy of accomplishment when we see that the aforesaid proposed four dams would hold about 490 trillion gallons. During the period of 1930 through 1951 records show that on an average of 153 days per year Green River at Livermore averaged a flow of about 3 billion gallons or more daily. There is nothing regular about this because, for example, during the 1937 flood it reached a maximum of around 120 billion gallons daily. A flow of 3 billion gallons daily at Livermore means about a foot of water passing over the Rumsey dam. This is not arbitrary, but seems ideal.

Now, to simplify matters, let us assume that on the other 212 days of each year an average of only 2 billion gallons daily would be needed from the storage behind the dams to maintain the even and ideal flow of 3 billion gallons daily. The total withdrawal would amount to 424 trillion gallons, well within the total capacity behind the four dams.

Thusly, several huge industries could be served as in the Tennessee Valley, which has no coal worthy of mention along its waterways as does the Green River Valley. But take note that while coal can be transported to the water in the same sense it is not easy to transport water to the coal excepting by storage and release as outlined.

Now just how are the high-water problems of the farmers taken care of in this plan? Obviously, during the periods of heavy rainfall excess water, over and above the seemingly ideal flow of 3 billion gallons daily at Livermore, must be stored behind the four proposed flood-control water-storage dams. Just what can be expected as a result? We can give no exact data for the four dams but, under the wonderful 1931 plan involving seven dams storing about 550 instead of 490 trillion gallons behind the four dams, it was estimated that the January 1913 flood stage at Rumsey would have been reduced by 2.3 feet, at Woodbury 8.3 feet, and at Brownsville 11.1 feet.

While the reduction at Rumsey is nothing spectacular, nevertheless the 1913 flood was exceedingly high and like that of 1937 these do not come every year, but, the average floods seemingly would be well contained, especially in the case of those between November 1951, and last April. The operation of the dams would only serve to complicate matters. Anyway, hydropower would be more costly than steam here. By oversimplifying we have given the essentials for those who scoff at the idea that Green River does not have enough water for industry during certain periods. They do know there is too much water at times. Those with engineering knowledge will appreciate the technicalities of importance must be avoided in an article of this nature intended to inform the average valley citizen intensely interested in being freed from existing economic slavery.

[From the Messenger, Central City, Ky., June 6, 1952]

Everyday Citizens Are Enthusiastic About Green River Valley

For some time it has been our desire to report on the interest shown in the work and objective of the Green River Valley Citizens League, Inc. At times there is evidence of deep interest from unexpected sources. "I wish they'd fix up the river like I've been reading about." This from a valley worker was a surprise because one would think him unwilling to bother with the reading of dry economic data. (Although some workers have contributed dues to the league.)

Then, at a recent league meeting, out of a clear sky a leading and substantial farmer made the startling statement that "Green River is filling up and causing premature flooding"—which is a fact long known to navigation interests. Nevertheless, other farmers strongly supported the contention with a sincerity that was as impressive as surprising to league leaders who grope along in their efforts wondering whether there is any real support to be forthcoming from the "grass roots" of the farms as well as the mines, stores, homes, and shops of the valley.

Another test comes from the high places of business where you would think that busy executives would not so much as take the time to attempt reading the league's abnominally printed weekly news-notes. Yet we have complaints on these poor copies from such men but never on the context of the notes.

While all of this is encouraging in a way, the stark fact remains that these people possess the real power to free the valley from economic slavery. That, after all, in a nutshell is the objective. The very selfish opposing interests have no real power whatsoever and will not stand and fight in the open unmasked. Why? Because they know their appeal will be rebuked by the grass roots for obvious reasons. For example, if one area is enjoying the benefits of flood protection and modern navigation as the result of Federal spending, it comes with poor grace for the people of that area to contend "It's a waste of the taxpayers' money" to give equal treatment to another area.

But Green River Valley inhabitants must not keep those convictions secret or assume that boodle will do the trick. People in all walks of life must speak out especially to their civic leaders. And, above all, to the candidates for, and the holders of, public office whether city, county, State or national. A mere "I wish they'd fix up that river" will do wonders. With help of that kind the league can obtain substantial results. Without that help the league is nothing.

[From Green River Republican, Morgantown, Ky., April 10, 1952]

Way To Prevent Low Flow of River Is To Build Upper Storage Dams

1. Although needed modernized navigation precipitated current activities, flood control becomes more and more important every day in the considerations of the Green River Valley Citizens League, Inc. This is to be expected as a result of almost constantly high water in the lower part of the valley since last November. Yet the subject keeps bobbing up regularly under the guise of water control where industry is concerned.

2. For example, reliable data indicates an average discharge (water flow) in Green River at Livermore over 19 years of some 10,000 cubic feet per second. Figuring 7½ gallons per cubic foot, the flow amounts to the tremendous total of 4,500,000 gallons per minute. Mind you, this is an average because in the 1937 flood it was 20 times as much and in the 1930 dry spell it was only 3.5 percent of the average. Now the average is wonderful because it would support

many, many synthetic fuel or power plants, but a threatened low-flow of only 126,000 gallons per minute is not desired even if it doesn't happen often. Hence danger of low flow must be eliminated.

3. The way to prevent low flow is to store water during plenty and release it during scarcity. This is precisely what is done to effect flood control, which the valley needs so badly. Here we clearly have an improvement project that everyone in the valley can support. That a genuine interest might be aroused is indicated by an editorial of March 28 in the Ohio County News of Hartford:

"FLOODS POINT UP NEED FOR CITIZENS LEAGUE

"The need for all Ohio countians getting into the Green River Valley Citizens League and helping to form a policy which backs flood control along Green River and its tributaries was accentuated by the floods which followed the heavy rains of Friday night and Saturday.

"The cleaning out of Rough River and building of dams in its upper reaches for controlling the flow of its water has long been needed. And with the continuing denuding of forests along its route the necessity constantly becomes more urgent.

"With little timber land left to slow down the flow of water during and following rains it soon reaches the stream in quantities which quickly cause it to overflow its banks along its course. Farms are inundated, soil carried away, fences and buildings damaged or destroyed, basements filled, streets and roads made impassable.

"Right here in Hartford during the week-end citizens were affected by the immediate flow of water and now by surrounding high waters.

"Times have changed, and if the agriculture of the rich bottom lands is to be maintained and inconveniences prevented we must see that the river is cleaned out and that the control dams across the stream are built. Congressmen and other officials pay little heed to individuals or small groups, but if the Green River Valley should become aroused action could be obtained.

"Uniting under the Citizens League banner seems the logical thing to do."

Our news-notes of last week also treated with flood control which Ray Gaines ably reported in the Park City News of Bowling Green, April 1. We quote him in part:

"Reis asks if we could not decide on the necessity for the Mining City Dam after observing the effectiveness of the other four dams.

"The four dams referred to by Reis were provided for in the Flood Control Act of 1938.

"They are:

"1. A reservoir 10 miles northeast of Scottsville on the Barren River, having a total capacity of 506,000 acre-feet, or something in excess of 150 billion gallons.

"2. No. 2 Green River reservoir above Mammouth Cave with a capacity about half of that of the reservoir near Scottsville. He believes this dam would protect Mammoth Cave from flooding such as experienced during the recent flood.

"3. A reservoir on the Nolin River about 9 miles above its mouth with a capacity nearly as much as the Barren River Reservoir.

"4. A reservoir on the Rough River 6 miles upstream from Falls of Rough with a capacity about 60 percent of the Barren River project.

"Reis contends that these four dams would act as storage basins for water to be used for industrial and other purposes during dry seasons, in addition to aiding in flood control.

"He adds that Congress need only to vote the money for the four dams since the 1938 law authorized their construction."

The valley could have had the four dams, and more in the early thirties. The league's task is to compose and coordinate plans and efforts for these and other projects making up an over-all development that woud place the Green River Valley among the foremost. We have everything excepting the will to get it done.

[From the Ohio County News, Hartford, Ky., May 2, 1952]

RESOLUTION URGES IMMEDIATE BUILDING OF FOUR FLOOD-CONTROL DAMS ON RIVER

A carefully worded resolution recommending the immediate construction of four flood-control dams in the upper reaches of streams in the area was passed at a meeting of directors of the Green River Valley Citizens League at Livermore, Friday night.

The gathering was attended by a large, representative number of interested valley residents, in addition to the directors.

The dams proposed are (*a*) on Green River near Mammoth Cave, (*b*) on Nolin River about 9 miles above the mouth of that river, (*c*) on Rough River 6 miles upstream from Falls of Rough, (*d*) on Barren River 10 miles northeast of Scottsville.

These were authorized in the 1938 Flood Control Act of Congress, but no appropriation for their construction was ever made.

The resolution carried without a dissenting vote. It also included a paragraph favoring the so-called Watts bill providing "on the land" water control. There was much discussion of this bill with Gen. Wayland Rhoads speaking with obvious effect.

Judge A. J. Bratcher when called upon to speak referred to Judge W. A. Moore, who spoke on Another Mark on the Old Beech Tree. He depicted the higher and higher floods which have menaced the valley within the past century. Both men are citizens of Morgantown.

Among others who spoke were Harry Gatton of Bremen; L. J. Turner, Dundee; Hecht Lackey, Henderson; Gordon Chase, Reed; James Hays, Rochester; Col. Oren Coin, Livermore; President James R. Hines, Bowling Green; Stephan A. Wakefield, assistant director of flood control and water usage, Frankfort, and others.

The president asked that a resolution be passed urging the Army engineers to clean out Green and Barren Rivers in order to alleviate undue flooding, improve drainage, and keep the streams open for navigation.

[From U. S. Department of Commerce Field Service Bulletin of Commerce, Cleveland, Ohio, August 15, 1952]

MORE PRACTICAL TO BUILD INDUSTRIAL PLANTS NEAR WATER THAN NEAR POWER

Instances of stoppage of defense production for lack of water in recent weeks has spotlighted the emphasis placed in the President's Materials Policy (Paley) Commission's report on essentiality of water for industrial operations.

Two important but opposing facts are brought out in the Paley report. One relates to demand. Industrial use of water for processing is estimated at 80 billion gallons a day in 1950. This amounts to eight times the quantity used for the purpose in 1900, although the population increases, which influence the market for industrial products, have risen only twofold. Even faster-paced than the demand for total water is the need of certain industries for pure water practically free of organic matter, acids, gases, or minerals. The other point which the Paley report demonstrates is the growing inadequacy of the water supply to meet the industrial demand. This fact follows upon heavy pumping from underground sources and siphoning off of surface water in lakes and streams. At the same time, wastes discharging from municipalities, factories, and abandoned mines are polluting the sources of water.

It is more practical to locate industrial plants near a good water source and bring electric power from a distance, if necessary, than to build near power and have to transport water. Studies have shown that a 36-inch water line takes eight times the amount of material and 10 times as much money to build as a 15-kilowatt power line serving a comparable need.

[From News-Notes, Green River Valley Citizens League, Inc., December 4, 1952]

Under date of November 24, 1952, Mr. Henry R. Gonner, manager of the Evansville Chamber of Commerce, wrote Senators Clements and Cooper and Congressman Withers:

"The Evansville Chamber of Commerce was represented by its transportation director, Mr. A. M. Stephens, at the joint hearing of the Public Works Committees of the United States Senate and House of Representatives in Central City, Ky., on September 20, at which time the twin problems of navigation and drainage for Green River were aired before some 350 farmers, coal operators, miners, civic officials, and industrialists, in a meeting sponsored by the Green River Valley Citizens' League and dignified by many Government officials and Kentucky Members of Congress.

"The official report to this organization indicates the league's program for early construction of the four flood-control dams in the far reaches of Green River; the immediate initiation of a water and intensified soil conservation program for the river valley, and the related navigation improvements hoped for, all of which seem to have found general and moral support from all interested Government agencies. This includes the Corps of Engineers which, as we understand, will probably report their findings and recommendations about March of next year, as to some of the navigation and drainage phases.

"I am authorized to say that the Evansville Chamber of Commerce is, therefore, deeply sympathetic to the general improvement program of the league, and particularly does it subscribe to the representation that of great importance to the river valley is the necessity for industrial improvement which is wholly impossible without a very substantial and continuous supply of water. Combined with planned farm management embodying soil and water conservation for crop and other uses, the valley will be relieved of many of the frequent flood threats so destructive to the people of that area. The attendant actual and potential benefits to the Green River Valley interests are obviously no less important to the Evansville manufacturers, wholesalers, retailers, etc., who have a deep and abiding interest in the social and economic welfare of their good friends in the related trading area throughout most of the Green River section.

"May we be recorded, therefore, as another industrial community sympathetic to the general improvement program of our Kentucky neighbors in the definite knowledge that the economic improvement of this one area as contemplated will surely contribute to the improvement of other areas as it has invariably done in the past."

GREEN RIVER VALLEY PROGRAM

The Courier-Journal September 23 editorial entitled "An Alternate to Mining City Dam?" suggests: "Members of the Green River Valley Citizens League, Inc., should formulate an alternative river-development program that would permit control of the river without Mining City Dam." Exactly that has been done. At the public hearing September 20 before a joint subcommittee of the United States Senate and House of Representatives Public Works Committees the program was tacitly approved, as follows:

(*a*) United States Department of Agriculture run-off and water flow retardation and soil erosion prevention in the Green River watershed of Kentucky and Tennessee. This is covered in the Eighty-second Congress by Congressman Watts' H. R. 6473 and Senators Underwood and Clements' S. 2616. It all encompasses subwatershed waterways, gully stabilization and sediment control, road and railroad bank stabilization, channel improvement and stream bank stabilization, all of which in turn involves such items as tile drainage, pasture improvement, gully control, desilting basins, sodded waterways, terraces, strip cropping, reforestation, small flood-control dams, farm ponds, protected woodlands, diversion ditches and contour cultivation, etc.

(*b*) United States Army Corps of Engineers flood-control water-storage projects (to be built at the earliest possible date as per league's April 25 resolution):

(1) Green River No. 2 reservoir with dam site about 259.1 miles above the mouth (authorized by 1938 Flood Control Act);

(2) Nolin River Reservoir in Edmonson County with dam site about 9 miles above the mouth (authorized by 1938 Flood Control Act);

(3) Barren River No. 2 reservoir with dam site about 10 miles northeast of Scottsville, and 79.2 miles above the mouth (authorized by Flood Control Act of 1938);

(4) Rough River Reservoir with dam site about 89.3 miles above the mouth and 6 miles upstream from Falls of Rough (authorized by Flood Control Act of 1938);

(5) Flood protection project—Rough River channel improvement (authorized by Flood Control Act of 1944);

(6) Flood protection project—Barnett Creek channel improvement (authorized by the Flood Control Act of 1944).

(*c*) United States Army Corps of Engineers drainage and navigation project (now under survey as per resolution by United States Senate Public Works Committee April 15, 1949):

(1) Modernized navigation on Green, Barren, and Rough Rivers without disturbing the present normal level of Green River pool No. 1. In addition, the

United States Army Corps of Engineers has been requested to give serious consideration to the proposition of moving the dam presently located at Spottsville to a suitable location upstream above the mouth of Panther Creek for the purpose of improving drainage in the Panther Creek watershed, as requested in the United States Senate Public Works Committee resolution of March 28, 1951. Further, that the United States Army Corps of Engineers be urged that the dam presently located at Rumsey above Long Fall Creek should be replaced by a new dam in the same location. That locks Nos. 1 and 2 on Green River be replaced with standard Ohio River locks 600 by 110 feet. That the minimum channel of 9 feet throughout the Green, Barren, and Rough Rivers be installed so that 12 feet can instantly be had when required;

(2) Improved drainage in the Panther Creek Valley of Daviess County to be accomplished if possible as suggested above by moving Green River No. 1 dam to a suitable location above the mouth of Panther Creek;

(3) Improved drainage for Mud River Valley by diverting Mud River to empty below instead of above Green River dam No. 3;

(4) Improved drainage for Little Muddy Creek by making it flow through Back Swamp Branch below instead of above Green River Dam No. 4;

(5) Improved flow to Long Fall Creek by removing a rock ledge obstruction near its mouth just below Green River dam No. 2.

(*d*) United States Army Corps of Engineers drainage and channel maintenance work for Green, Barren, and Nolin Rivers to start about October 1, with the funds allocation of $50,000 announced by the Office of the Chief of Engineers, Washington, D. C., September 26.

Col. Paschal N. Strong, Ohio River division engineer, Cincinnati, replied in the Point of View of the Courier-Journal September 28 which fits in perfectly with the aforesaid league over-all program.

Col. Wright Hiatt, Deputy Chief of Civil Works for Flood Control, Office of the Chief of Engineers, who was here for September 20 public hearing, pleasantly surprised us with the $50,000 allocation mentioned above.

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